

**NATURAL HERITAGE INVENTORY
OF THE PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR
IN THE CLEAR CREEK RANGER DISTRICT
OF THE ARAPAHO-ROOSEVELT NATIONAL FOREST**

FINAL REPORT

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EXECUTIVE SUMMARY

In 1992, the Colorado Natural Heritage Program (CNHP) joined efforts through a Challenge Cost-Share Agreement with the Clear Creek Ranger District of the Arapaho-Roosevelt National Forests to conduct a Natural Heritage Inventory of the proposed corridor of the Continental Divide Trail. The goal of the inventory was to systematically identify the localities of rare, threatened, or endangered species and the locations of significant natural communities (as represented by plant associations).

The Natural Heritage Inventory was conducted in six steps:

1. Review aerial photographs, topographic maps, soil maps, and geological maps.
2. Gather existing information.
3. Map the "potential natural areas" from information gathered in steps 1 and 2.
4. Perform initial ground surveys.
5. Complete an inventory of the PNA's.
6. Compile the results and prepare a final report.

At the completion of the inventory, the CNHP had records of three rare vertebrate species, 0 rare invertebrate species, fifteen rare plant species, and eight natural communities/plant associations of statewide significance. Many of these elements of natural diversity are sensitive to unnatural disturbance or may be sought out by collectors. For this reason, the exact locations have not been presented in this report. Requests for additional information on these resources should be addressed to: Colorado Natural Heritage Program, c/o University of Colorado Museum, Hunter 115, Campus Box 315, Boulder, CO 80309-0315.

Twenty-six Potential Natural Area's (PNAs) were identified during preparatory stages of the inventory (**Table 2 and Figure 1**). Of these, twelve were found to support natural heritage resources (rare, threatened, or endangered species and significant natural communities/plant associations). Using information from other sources and the results of this inventory, we have mapped out 15 significant biodiversity areas which range in size from 32 to 1,600 acres (**Figure 2**). For these areas, the staff and network scientists of the CNHP developed conservation planning boundaries. In developing these boundaries, Natural Heritage staff and contracted scientists considered a number of factors including habitat for rare species,

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protection of water quality, and buffers from potentially detrimental land uses.

The delineation of conservation planning boundaries in this report does not confer any regulatory protection on recommended areas. These boundaries are intended to be used to support wise planning and decision-making for the conservation of these significant areas. The CNHP encourages the Arapaho-Roosevelt National Forest to take appropriate actions to protect these sites. We believe such actions to be consistent with the Forest Service Manual, the New Perspectives initiative, and the Ecosystem Management initiative from the Chief, USFS. CNHP offers its assistance in working with the Arapaho-Roosevelt National Forest to ensure protection of these areas.

The report includes seven recommendations for the Clear Creek District and the Forest:

1. Where appropriate, large areas of biodiversity significance should not be fragmented unavoidably. This recommendation extends to currently unfragmented areas.
2. Location of the Continental Divide Trail Corridor should be done with a minimum of impacts to natural heritage resources.
3. Expand public and staff awareness of the need for protecting significant biodiversity areas.
4. Facilitate the designation of appropriate areas as Special Management Areas, Special Interest Areas, or Research Natural Areas.
5. Properly manage all areas known to be inhabited by sensitive, rare, threatened, or endangered species, or the locations of significant natural communities to assure that these elements of natural diversity persist within the context of a natural ecosystem.
6. Continue inventory/survey efforts in the study area, particularly for rare, threatened, and endangered animal species.
7. Research should be conducted made to determine the extent to which neotropical migratory landbirds use willow carrs in the post-breeding and migratory seasons.

In addition, we have compared the possible impacts to each of three trail corridor alternatives. All proposed routes will impact some populations of sensitive species or natural communities. Alternative A would impact 5 known significant sites. Alternative

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B could impact 8 sites and Alternative C could impact 2 sites. Two Conservation Sites were impacted by all alternatives. Of the three alternatives, C is recommended as the least harmful to the biological diversity of the area. Finally, we recommended that James Peak and Guanella Pass be reevaluated as to the need to have them as connecting points for the trail corridors.

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INTRODUCTION

In July 1992, the Colorado Natural Heritage Program (CNHP) was contracted by the Clear Creek District of the Arapaho-Roosevelt National Forest to conduct an inventory of: (1) the proposed Continental Divide Trail corridor; (2) the Mt. Evans corridor; (3) the Mt. Goliath Research Natural Area; and (4) the proposed Bakersville to Loveland Pass bike path corridor. The goal of the inventory was to systematically identify the localities containing natural heritage resources.

Natural heritage resources are defined as the rare, threatened, endangered, or sensitive species and significant natural communities/plant associations that are monitored for their biodiversity significance by the CNHP. In short, we were to identify those sites supporting unique or exemplary natural communities, rare plants and rare animals, and other significant natural features.

This inventory has been completed, and the results of it are presented herein. A brief overview of the natural condition of the study area is presented first. This is followed by an outline of the mission and methodology of the CNHP. The results of the inventory are briefly discussed. Finally, the areas of biodiversity significance identified during this study are described and future actions, including protection options, are introduced.

Overview of the Study Area

The study area is restricted to part of the Clear Creek Ranger District of the Arapaho-Roosevelt National Forest (**Figure 2**). The District is approximately 173,000 acres within the Front Range of Southern Rocky Mountains physiographic region. Elevations range from ca. 7,500' to over 14,000', encompassing the Montane, Subalpine, and Alpine Tundra life zones. More than 1,600 plant species occur within the area (Weber, 1976), including several endemic species. Perhaps more typical are those species and communities that are considered disjuncts from more northern areas.

Climate. The climate of the area is very complex due to the elevation variations. However, the area is a typically cool continental climate with modest rainfall. However, although most areas of the region average approximately 15 inches of moisture, some of the higher mountain areas get 40 inches or more. Of course a considerable portion of this is rainfall. Most of the precipitation occurs during the spring and fall "wet seasons".

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Soils. The soils of the area are complex and variable. Many soils are azonal, especially at higher elevations. However, a great variety of zonal and intrazonal soils also occur. Over much of the study area soils are neutral to slightly acidic, having a great influence on the plant composition.

Geology. The geology of the area is relatively simple, being composed largely of Precambrian rocks, gneiss, schist, and granite. However, the ores and minerals that are found within this ancient material has had extensive and relatively permanent impacts on the area. Some of Colorado's busiest mining activity has occurred within the Clear Creek Ranger District, most of it historically.

Current Vegetation. The vegetation of the Clear Creek Ranger District is typical of the Front Range. The dominant vegetation below treeline is that of coniferous forests, ponderosa pine-dominated at the lower elevations, Lodgepole pine at middle elevations, and spruce-fir at the highest elevations. At or near treeline, Bristlecone and Limber pines are common, often associated with Subalpine fir and forming krummholz patterns.

Above the treeline an array of alpine tundra communities occur. Such names as Kobresia meadows, fellfield, scree and talus, cushion plant communities, and alpine wetlands define the general vegetation.

Within this mosaic of vegetation are many wetland types. Not the least of these are riparian zones. At the lower elevations these may be dominated by deciduous trees and shrubs (such as narrowleaf cottonwood, birch and alder). At higher elevations, including most of the study area, blue spruce, Douglas fir, and others dominate. Willow carrs are shrubby wetlands that generally occur in level basins, floodplains, or high elevation seeps. These carrs are highly significant to the fauna of the area.

Finally, throughout all of the forest- and shrub-dominated areas occur grasslands and meadows. High quality examples of many of these habitats have become quite rare, but they are also poorly studied.

Faunal Composition. The fauna of the Clear Creek Ranger District is typical of the Southern Rocky Mountains. Typically no vertebrates and few invertebrates are endemic to the area. However, the invertebrates have been poorly studied, particularly in the alpine (with the exception of a few research sites). The remoteness of some portions of the study area are indicated by the continued presence of the Lynx. Wolverines are known from the recent past, but may have been extirpated from the area. In contrast to the remoteness, Interstate 70 bisects the District, the Denver metropolitan area is less than 50 miles to the east, second

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home and rural residential dwellings are rapidly encroaching from the east, and recreational demands place enormous pressures on land managers and the natural heritage of the area.

Colorado's Natural Heritage Program

The Colorado Natural Heritage Program (CNHP) is the latest stage of a fourteen year development. Building on a solid base of biodiversity information, CNHP was relocated from the Division of Parks and Outdoor Recreation into the University of Colorado Museum in the spring of 1992. With an increased staff, the Program is revitalized and updating comprehensive information on the rare, threatened, and endangered species and significant ecosystems in Colorado. The multi-disciplinary team of scientists and information managers gather information and incorporate it into the continually updated databases. CNHP is part of an international network of conservation data centers that use the Biological and Conservation Databases (developed by The Nature Conservancy). Concentrating on site-specific data for each element of natural diversity, the accurate status of each element is known. The mapped data illustrate sites that are important to the conservation of Colorado's natural biological diversity. By using the element ranks and the quality of each occurrence, priorities can be established for the protection of the most sensitive sites. It is by having an updated locational database and priority-setting system that CNHP can provide its most effective, proactive land-planning tools.

The information gathered by CNHP is on species, natural communities, and ecosystems. Each of these significant natural features (species and community types) is an **element of natural diversity**, or simply an **element**. Each element is assigned a rank that indicates its relative rarity on a five-point scale (1 = extremely rare; 5 = abundant; **Table 1**).

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Table 1. Definition of Natural Heritage state rarity ranks. Global rarity ranks are similar, but refer to a species' rarity throughout its range. State and Global ranks are denoted, respectively, with an "S" or a "G" followed by a character. Note that GA and GN are not used and GX means extinct. These ranks should not be interpreted as legal designations.

S1	Extremely rare; usually 5 or fewer occurrences in the state; or may be a few remaining individuals; often especially vulnerable to extirpation.
S2	Very rare; usually between 5 and 20 occurrences; or with many individuals in fewer occurrences; often susceptible to becoming endangered.
S3	Rare to uncommon; usually between 20 and 100 occurrences; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances.
S4	Common; usually > 100 occurrences, but may be fewer with many large populations; may be restricted to only a portion of the state; usually not susceptible to immediate threats.
S5	Very common; demonstrably secure under present conditions.
SA	Accidental in the state.
SH	Historically known from the state, but not verified for an extended period, usually > 15 years; this rank is used primarily when inventory has been attempted recently.
S#B	Same rank as the numbered S-series, but refers to the breeding season rarity of migrants.
S#N	Same rank as the numbered S-series, but refers to the non-breeding season rarity of migrants; where no consistent location can be discerned for migrants or non-breeding populations, a rank of S2N is used.
SU	Status uncertain, often because of low search effort or cryptic nature of the element.
SX	Apparently extirpated from the state.

The primary criterion for ranking elements is the number of occurrences, i.e. the number of known distinct localities or populations. Also of great importance is the number of individuals at each locality or, for highly mobile organisms, the total number of individuals. Other considerations include the condition of the occurrences, the number of protected occurrences, and threats. However, the emphasis remains on the number of occurrences such that ranks are an index of known biological rarity. These ranks are assigned both in terms of the element's rarity within Colorado (its State or S-rank) and the element's rarity over its entire range (its Global or G-rank). Taken together, these two ranks give an instant picture of the rarity of the element. Although most species protected under state or federal endangered species laws are extremely rare, not all rare species are listed as endangered or threatened, and Natural Heritage rarity ranks should not be interpreted as legal designations.

The spot on the landscape that supports a particular population of a specific species or a specific stand of a given

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community type is an **element occurrence**. The CNHP has mapped over 3,500 element occurrences in Colorado. Information on the location and quality of these element occurrences is also entered into the computerized Biological and Conservation Databases (BCD). This computer system, developed by The Nature Conservancy, is utilized by the international network of heritage programs and conservation data centers. All centers utilize the same methodology, allowing a unique, direct comparison of information throughout the area covered.

In addition to ranking each element in terms of rarity, Natural Heritage staff scientists rank each element occurrence so that protection efforts can be aimed not only at the rarest elements, but at the best examples of each. Element occurrences are ranked in terms of the **quality** (size, vigor, etc.) of the population or community, the **condition** or naturalness of the habitat, the long-term **viability** of the population or community, and the **defensibility** (ease or difficulty of protecting) the occurrence. Given the intimate relationship between a natural community and its environment, community occurrences are largely ranked in terms of their quality and size.

One of the ways that the Colorado Natural Heritage Program uses these element and element occurrence ranks is to assess the overall significance of a site, which may include one or many element occurrences. Based on these ranks, each site is assigned a **biodiversity** (or B-) **rank**:

- B1 Outstanding Significance: only site known for an element or an excellent occurrence of a G1 species.
- B2 Very High Significance: one of the best examples of a community type, good occurrence of a G1 species, or excellent occurrence of a G2 or G3 species.
- B3 High Significance: excellent example of any community type, good occurrence of a G3 species, or a large concentration of good occurrences of state rare species.
- B4 Moderate Significance: good example of a community type, excellent or good occurrence of state-rare species.
- B5 General Biodiversity Significance: good or marginal occurrence of a community type, S1, or S2 species.

U. S. Forest Service Memorandum

The Nature Conservancy (TNC), the parental organization of the

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CNHP, is proud of its relationship with the U. S. Forest Service. Similarly, we are stimulated by the new challenges and mutual benefits that the relationship between CNHP and Colorado's national forests provide. Most apparent is the mutual efforts to protect the forest's natural heritage. The Nature Conservancy and the U. S. Forest Service currently operate under a Memorandum of Understanding for biological inventory, information exchange, rare species management and protection on the U. S. national forests (**Appendix E**). This agreement has served as a template for many mutually beneficial projects.

What is Biological Diversity?

Biological diversity has recently become an important management issue for many natural resource professionals and forms the basis for the "New Perspectives" and the "Ecosystem Management" initiatives of the U. S. Forest Service. In the most simple terms, biological diversity, or simply biodiversity, is the full variety of plant and animal life in an area **AND** the ecological processes of which they are a part. This concept includes all living organisms from bacteria and fungi, invertebrate animals, mosses and lichens, and the "higher life forms" of plants and animals.

The biological diversity of an area can be described at four levels:

1. Genetic Diversity -- the genetic variation within a population and among populations of a plant or animal species. The genetic makeup of a species is variable between populations of a species within its geographic range. Loss of a species' population results in a loss of genetic diversity for that species and a reduction of total biological diversity for the region.
2. Species Diversity -- the total number and abundance of plant and animal species in an area.
3. Community Diversity -- the variety of natural communities or ecosystems within that area. These communities may be diagnostic or even endemic to an area.
4. Landscape Diversity -- the type, condition, pattern, and connectedness of natural communities or ecosystems within a landscape. Fragmentation of forested landscapes, loss of connections and migratory corridors, and loss of natural communities all result in a loss of biological diversity for a region.

All of the sites presented in this report support important

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components of the total biological diversity of the Arapaho-Roosevelt National Forest. Protection for these sites will represent protection for genetic, species, community, and landscape diversity on the forest.

Relating this Report to Managing Biological Diversity at the Landscape Level.

The management of Biological Diversity must consider more than species specific management criteria and in a context of multi-use across the National Forest. The conservation sites identified in this study should be considered a core areas for the protection of the full range of biological diversity. Some of these areas are best considered as candidates for special area designations, others as sites within a landscape that should be managed to include the maintenance of the site's integrity.

The Arapaho-Roosevelt National Forest's Clear Creek District has begun to move beyond single species management, as has the entire Forest Service, and to management based upon an ecosystem approach. A basic premise in the landscape management approach starts with the delineation of core protected areas that would be represented by Wilderness Areas, Research Natural Areas, Special Interest Areas, and Special Management Areas. Where possible, these should be connected through corridors and appropriately buffered. Buffers should include the ecological processes supporting the diversity of the core area. Such is the basis of the development of preliminary conservation planning boundaries. (see p. 14-15)

METHODS

Natural Heritage staff initiated prioritized inventories in order to gather information on Colorado's rare species and communities in a more thorough and systematic manner. Given that some regions of the state face greater development pressures than others, Natural Heritage staff and network scientists are attempting to inventory the most highly threatened areas first. The Natural Heritage staff conducts a natural heritage inventory in six stages:

1. Review aerial photographs. Aerial photographs of the entire survey area were reviewed in detail to identify Potential Natural Areas (PNA's) to be studied in the following stages. Photographs were provided by the Clear Creek Ranger District and dated 27 August 1990. These photographs were compared with topographic maps, soil maps, and geological maps to enhance our ability to detect significant habitats.

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2. Gather existing information. The herbarium collections of the University of Colorado were visited by Natural Heritage scientists where label information from specimens pertaining to the study area was recorded. Published and unpublished information for the inventory information was reviewed as time allowed. This included the gathering of maps, reviewing the BCD and manual Natural Heritage data, and consulting experts.
3. Refinement of Potential Natural Area numbers and boundaries. From information gathered in steps 1 and 2, map the "potential natural areas" with ecosystem boundaries.
4. Perform initial ground surveys. There are several purposes of this stage. One is to identify access routes and conditions of terrain. A second purpose is to screen the PNA's to eliminate those that show signs of substantial disturbance not visible from aerial photographs. This stage also eliminated those areas which may have been misinterpreted from aerial photograph examination. A third is to plan for the main survey of PNAs that still show potential as significant biodiversity areas. Among decisions to be made are when the survey can best be conducted, which scientist(s) should be involved (i.e. what is the potential for rare plants, rare animals or exemplary communities), and how much time should be budgeted for completing the survey. Where there is a need to verify the accuracy of the photo interpretation conducted during stage 1, these stages may overlap.
5. Complete an inventory of the PNAs. At this time detailed information is collected on the presence and status of unique or exemplary natural communities and rare species that are present, the extent of the feature(s) that make the PNA significant, and the area that needs to be protected to preserve those features. Threats and past or present disturbances are also noted. For element occurrences found to be of statewide significance, these data are transcribed onto Natural Heritage Program maps and entered into the BCD databases. (See **Appendix D** for examples of Natural Heritage data forms.)
6. Compilation of results and preparation of final report. As fieldwork is completed, Natural Heritage staff scientists review the information gathered. Based on a review of all natural heritage resources present, the staff prioritized the sites in terms of their significance and the threats facing them, develops and maps preliminary conservation planning boundaries, and drafts protection and management recommendations. This information is then combined into a report to the contracting agency/organization.

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RESULTS

The Natural Heritage Inventory of the proposed Continental Divide Trail corridor, the Mt. Evans corridor, the Mt. Goliath Research Natural Area, and the proposed Bakersville-Loveland Pass Bike Path route has been completed. During the 1992 field season (July-September), Natural Heritage staff and network scientists concentrated on completing field surveys of priority PNAs and species (steps 4 and 5 of the inventory). Based on the results of the inventory, preliminary conservation planning boundaries were developed for natural heritage resources, and these sites were prioritized in terms of their contribution to maintaining the State's and Forest's natural biological diversity.

Information Collection Phase

Color Infrared photographs of the entire study area (dated 1990) were reviewed in conjunction with 1:24,000 scale topographic maps. When compared with information existing in the Biological Conservation Databases (BCD), a total of 26 PNAs were identified.

The herbarium at the University of Colorado Museum, Boulder, was searched to verify existing records and enhance search images. Contact with local naturalists and experts provided leads on several rare plants and significant natural communities. From the literature and expert contacts, few rare animals were considered possibilities within the trail corridor. Others were considered extremely difficult to survey in a single warm season (e.g. lynx). Still others were not considered susceptible to the potential impacts of the trail corridor (e.g. certain high elevation butterflies). Therefore, animal search was confined to a few priority areas. The Colorado Natural Heritage Program currently has records of two vertebrates, 0 invertebrates, 15 plants, and eight significant natural communities from the study area in its databases (**Table 2**).

During the course of this inventory, Natural Heritage staff and contractors used the information collected from the PNAs to refine the classification of natural communities. Eight natural communities of statewide significance were identified in the study area (**Table 2**). The illustration of recommended conservation sites illustrates the known distribution of natural heritage resources in the study area (**Figure 2**).

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Table 2. Rare species and significant natural communities of the study area: Proposed Continental Divide Trail Corridor, Mt. Evans Corridor, Mt. Goliath Research Natural Area, and the proposed Bakersville-Loveland bike path.

<u>ELEMENT</u>	<u>COMMON NAME</u>	<u>GLOBAL RANK</u>	<u>STATE RANK</u>	<u>FEDERAL STATUS</u>	<u>STATE STATUS</u>
<u>Aquilegia saximontana</u>	Rocky Mountain columbine	G2G3	S2S3	3C	4
<u>Botrichia echo</u>	Reflected moonwort	G2	S?	-	3
<u>Botrichia hesperium</u>	Western moonwort	G3?	S?	-	3
<u>Botrichia minganense</u>	Mingan moonwort	G4	S?	-	3
<u>Bufo boreas</u>	Boreal toad	G5T4	S2	C2	
<u>Carex leptalea</u>	Bristle-stalk sedge	G4	S1	-	3
<u>Carex rostrata</u> wetlands	montane wetlands	G3G4	S3	-	-
<u>Carex rupestris/</u> <u>Geum rossii</u>	alpine wetlands	G4	S4	-	-
<u>Carex scopulorum</u> alpine wetlands	alpine wetlands	G3G4	S3S4	-	-
<u>Crepis nana</u>	Dwarf hawksbeard	G4	S2	-	-
<u>Deschampsia cespitosa/</u> <u>Geum rossii</u>	alpine wet meadow	G5	S5	-	-
<u>Draba grayana</u>	Gray's Peak whitlow-grass	G2	S?	-	4
<u>Draba porsildii</u>	Porsild draba	G3	S1	-	3
<u>Erigeron humilis</u>	Low fleabane	G4	S1	-	2
<u>Eriophorum gracile</u>	Slender cotton grass	G5	S2	-	3
<u>Felis lynx canadensis</u>	Lynx	G5	S1	C2	E
<u>Kobresia myosuroides/</u> <u>Geum rossii</u>	alpine turf	G5	S5	-	-
<u>Koenigia islandica</u>	a moss	G?	S1	-	2
<u>Oncorhynchus clarki</u> <u>stomias</u>	Greenback cutthroat trout	G5T3	S2	LT	LT
<u>Paludella squarrosa</u>	a moss	G?	S1	-	-
<u>Paronychia pulvinata/</u> <u>Silene acaulis</u>	alpine community	G5	S5	-	-
<u>Phippsia algida</u>	Snow grass	G4	S1	-	3
<u>Pinus aristata/</u> <u>Trifolium dasyphyllum</u>	Bristlecone pine/ Whiproot clover plant association	G2	S2	-	-

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<u>ELEMENT</u>	<u>COMMON NAME</u>	<u>GLOBAL RANK</u>	<u>STATE RANK</u>	<u>FEDERAL STATUS</u>	<u>STATE STATUS</u>
<u>Ranunculus gelidus</u>	Tundra buttercup	G4	S1	-	3
<u>Salix planifolia</u> - <u>Salix brachycarpa</u> / <u>Caltha leptosepala</u>	a willow carr	G4	S4?	-	-
<u>Saxifraga foliolosa</u>	Leafy saxifrage	G4	S1	-	3

Field Survey Phase

Field surveys conducted as part of the Lower Peninsula natural heritage inventory have revealed substantial new information on the natural history of the study area. Among the highlights are:

- The Mt. Goliath Research Natural Area, already impacted by early road construction, shows signs of degradation from trampling and casual trail development. However, we noted that the integrity of the site remains over much of the area. Restoration and protective measures are urgently recommended. Most of the negative impacts are observed near the parking area/information booth on the Mt. Evans road.
- The Summit Lake area remains one of the most significant areas in Colorado. There are no areas like it known in the continental United States. All of the rare plants and natural communities persist at the site. However, signs of overuse and potential threats abound and the integrity of the area is considered highly threatened. The preliminary conservation planning boundaries need to be extended to the area of tundra wetlands below the Summit Lake area.
- A high elevation wetland was located in a saddle between Mt. Evans and Mt. Epaulet. Dr. William Weber (University of Colorado, Herbarium) pointed out that the area has had only preliminary search, but a very rare plant in Colorado is known from a museum specimen. Further work is warranted.
- The boreal toad (Bufo borealis) was located in a single site. This species is placed in Category 2 of the U. S. Fish and Wildlife Service. Should this be a breeding site (in need of confirmation), it would be of considerable significance.
- The alpine of Colorado remains one of the least-studied ecological areas. This study aided the Colorado Natural Heritage Program in its understanding about the natural communities and conditions of this seemingly abundant habitat. Several highly significant areas were identified including the large alpine area on Stanley Mountain and the area below

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Summit Lake known as Summit Lake Flats.

- Two rare plant species were documented from Guanella Pass, adding to the significance of the site. This is the only known location in Colorado for one of the two rare plants and the site contains an exemplary high elevation willow carr.
- Further, the large number of neotropical migratory birds identified in Guanella Pass during the fall migration suggested that large, high elevation willow carrs may play a more important role during bird migrations than previously believed.

Identification and protection of rare and wide-ranging species.

The site level of inventory and protection so often a part of conservation strategies are not easily applied to some natural features. For example, the conservation of bird populations, particularly those that occur over large geographical areas, may best be implemented by establishing complimentary management practices over the entire occupied area. Local site protection efforts generally will only apply to a small, usually inadequate, portion of the entire population of such species. Such considerations may be of most importance for migrating birds.

In several sites during this study we observed large numbers of post-breeding warblers, sparrows, and other migrants. Most of the species observed are considered neotropical migratory birds (Partners-In-Flight's Western Working Group draft list). Most of the birds were observed in the habitat known as willow carrs. While these observations are few and of themselves not definitive, we believe that such habitats as are found in Guanella Pass may be of particular significance for post-breeding and migrating passerines. We are not alone in our preliminary conclusions (M. Carter, Colorado Bird Observatory, pers. comm.). Most of the research efforts on birds concentrated on the breeding season; however, we believe that research is warranted in habitats such as willow carrs during the post-breeding and migratory seasons.

Other rare, wide-ranging bird species that utilize the study area include raptors, particularly Peregrine falcons (Falco peregrinus), Prairie falcons (F. mexicanus), Golden eagles (Aquila chrysaetos), and Goshawks (Accipiter gentilis). In general, these birds are locally sensitive to increased human activity. It is unlikely that the development of the proposed Continental Divide Trail in the study area will have lasting impacts on the populations of any of these species. However, Peregrine falcons and Golden eagles utilize nesting sites year after year. Any known nesting sites for these species should be avoided. We did not observe any sites for these species in this study. Prairie falcons

PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT

are uncommon nesters in the alpine habitat, but may be encountered, particularly during migration. The Goshawk is a tree-nesting species with no lack of habitat. However, the species may be in decline for other reasons, human disturbance among them. To minimize impacts to this species, we would encourage that the trail avoid penetrating large tracks of unbroken forest, utilizing instead, trails and roads that already exist.

Among the mammals, the Lynx (Felis lynx) is a wide-ranging species that occurs within the study area (James Halfpenny, pers. comm.). We observed no direct evidence of the Lynx while conducting field survey, but recent evidence has confirmed their presence. This species has probably never been very common in Colorado (Armstrong, 1972). In fact, the boreal forests of the Southern Rocky Mountains is the southern extreme of their range. Armstrong (1972) suggested that its pre-1970 recognition as a predator probably caused a serious decline in Colorado. The species is protected and listed as Endangered by the Colorado Division of Wildlife and is placed in Category 2 by the U. S. Fish and Wildlife Service. It is likely that this species is sensitive to human disturbance, a probable cause for post-1970 declines in Colorado.

The effects of the proposed Continental Divide Trail on the Lynx population in the study area are difficult to predict; however, any intrusion into its habitat may have significant long term impacts. To minimize impacts to this sensitive species, we strongly recommend that the trail be restricted to areas that are already dissected by human activities.

Finally the issue of fragmentation should be considered. Large areas that experience few direct human impacts are becoming increasingly rare. The Forest Service recognized this rarity in the designation of Wilderness Areas. But it is likely that impacts caused by fragmentation occur at smaller scales as well. The Comprehensive Plan for the Continental Divide Trail recognized this as an issue and called for the utilization of existing trail wherever possible. We recommend that existing tread be used to the maximum extent possible.

Whereas most impacts from backcountry camping and hiking appear benign, consideration should be given to the long term impacts of the trail. Once designated, the CDNST will be in place essentially for perpetuity. Use of such a popular trail will only increase in the long run with a subsequent increase in the frequency and severity of impacts. We can also predict that these impacts will be greatest near trailhead or other access points. When considered in such a light, what appear to be benign impacts can be magnified, especially in the vicinity of sensitive resources. Serious consideration in the light of the current

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results are: disturbance to wide-ranging species such as lynx and wolverine, increased disturbance to breeding birds (especially with free-roaming pets), and the introduction of plant and animal species not native to any given site. Other considerations are documented within the scientific literature.

PROTECTION OF SIGNIFICANT BIODIVERSITY AREAS

Of the 26 PNAs identified during the study, 13 were dropped from consideration (**Appendix A**). The remaining 13 PNAs were found to support rare, threatened, or endangered species or significant natural communities. These sites and two additional ones are retained as Conservation Sites and are recommended to the Forest Service as areas in need of special protection. The CNHP in no way implies that areas that were studied but not considered conservation sites are not of importance for conservation purposes. The ranking system used merely ranks sites for protection relative to the rarity of known significant features. Therefore, the sites identified herein comprise the highest priority sites, based on known information, for the conservation of the study area's natural diversity.

Once a significant area has been identified, the first step in protecting the sensitive species or communities is to delineate a conservation planning boundary for the site. In developing these boundaries, Natural Heritage staff and contract scientists consider a number of factors. These include, but are not limited to:

- the extent of current and potential habitat for natural heritage resources, considering the ecological processes necessary to maintain or improve existing conditions;
- species movement and migration corridors;
- maintenance of surface water quality within the site and the surrounding watershed;
- maintenance of the hydrologic integrity of the groundwater, e.g. by protecting recharge zones;
- land intended to buffer the site against future changes in the use of surrounding lands;
- exclusion or control of invasive exotic species; and
- land necessary for management or monitoring activities.

The final 15 conservation sites found to support natural heritage resources range in size from 32 to 1,600 acres (**Appendix B, Table 2**).

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As the label "conservation planning" indicates, the boundaries presented here are for planning purposes. They delineate ecologically sensitive areas where land-use practices should be carefully planned and managed to ensure that they are compatible with protection goals for natural heritage resources and sensitive species. All land within the conservation planning boundary should be considered an integral part of a complex economic, social, and ecological landscape that requires wise land-use planning at all levels. Fortunately, all of the study area is largely managed by the Forest Service, an agency mandated to administer its lands under a policy known as Ecosystem Management. Such policies combined with special land designations (e.g. Special Management Areas, Special Interest Areas, and Research Natural Areas) provide the Forest Service with ample tools to assure the long term viability of each candidate natural area (see below). Maps showing these preliminary boundaries are included in **Appendix B**.

Figure 2 shows the locations of the 15 conservation sites identified during this survey. While many of the natural areas are known to support one rare species, other support several. The conservation sites also range greatly in their significance (**Appendix B**).

Protection Tools

Intensive land use in Colorado and multiple demands for many areas contribute to the continual degradation of many natural communities, endangered species habitat, and other types of natural areas. Best management practices can help protect critical buffers, but may not of itself be adequate in the protection of sensitive species and sites. The first and most significant and proactive tool for protection is the identification of locations of rare species, natural communities, and the ecosystems that support them. Only with this information can informed decision-making occur.

While the Forest Service has taken great strides to assure that its biodiversity is adequately protected, on a few designated natural areas exist. The Mt. Goliath Research Natural Area remains the only such designation. Even with such a protection tool, avoidable degradation has occurred. There is the need for additional protective measures. The Forest Service and The Nature Conservancy has jointly hired a Research Natural Area Ecologists to assist in designating special biological areas. The CNHP works closely with the Research Natural Area (RNA) ecologist to identify candidate areas for designation.

This document provides a base-level of information to begin a planned protection effort of the significant biodiversity features

PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT

within those portions of the Clear Creek Ranger District included in the study area. By using appropriate U. S. Forest Service protection tools, careful planning, and a monitoring program, the significant elements of natural diversity identified herein will be adequately conserved. We have used Forest Service guidelines to make recommendations for protection of each significant conservation site (**Appendix B**).

RECOMMENDATIONS

1. **Develop an implementation plan for designations of areas the Forest Service determines fulfill criteria for protection.**

This inventory has documented the existence of 15 sites determined to be significant for the protection of Colorado's and the Forest's natural diversity. By continuing to work with the CNHP, TNC, the Colorado Natural Areas Program, and other agencies and organizations, the Forest should consider including this report's recommendations in the Forest Plan's most recent revision. For those sites recommended for RNA status, review should be conducted by the RNA ecologist.

2. **Include the Colorado Natural Heritage Program in the review of projects in or near areas identified as significant.**

The areas identified in this study are known to support unique or exemplary natural communities and rare species. As proposed Forest activities are considered, they should be compared to the maps presented herein (**Appendix B**). The CNHP staff considers this contract the establishment of a continuing partnership and offer their expertise in reviewing project proposals that may affect the significant area or species. Since the early stages of the planning process typically offer the greatest flexibility, it is important to contact the CNHP at the earliest possible time.

3. **Expand public awareness of the need for protecting areas determined to be significant to the Forest's natural diversity.**

Given the proximity of the Forest to the densely populated metropolitan areas, natural lands are becoming ever more scarce. Rare species may continue to decline if not given appropriate protective measures. Increasing the public's knowledge of the remaining significant areas will build support for the programmatic initiatives necessary to protect them. Such activities could be done through interpretive facilities, conferences or meetings to stimulate public involvement, information pamphlets, and others. Finally, the

PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT

Forest Service should promote any protection designations to the public and scientific community to build awareness of the commitment to New Perspectives and Ecosystems Management policies.

4. Increase cooperation among pertinent organizations.

The long-term protection of the Forest's natural diversity will be facilitated with the cooperation of many organizations. The Forest Service has played a leadership role in attempting to incorporate diverse opinions in the planning process. Efforts to this end should continue, providing the Forest with stronger ties among federal, state, and local and private interests involved in the protection or management of natural lands. The example of the Mt. Evans Corridor Study Group provides a useful model.

5. Properly manage significant elements of natural diversity within the Clear Creek District study area.

The first step in accomplishing this recommendation would be the appropriate designation of deserving sites. In doing so, the development of management plans would be a necessary component of the designations. The CNHP and TNC are willing to assist the Forest in developing management plans. We would also encourage the development of partnerships that could research and develop techniques for maintaining or restoring conservation sites to aid in the preservation of rare, threatened, or endangered species or significant natural communities.

EVALUATION OF TRAIL ALTERNATIVES

Alternative A. This alternative would potentially impact 5 Conservation Sites as defined herein: James Peak, Guanella Pass, Bard Creek, Gray's Peak (secondary impacts) and McClellan Mountain. Two of these are common to all alternatives: James Peak and Guanella Pass. Of these, threats to Guanella Pass are of highest concern. In addition, fragmentation would occur along the 18 miles of new construction.

Alternative B. This alternative would potentially impact 8 Conservation Sites as defined herein: James Peak, Witter Peak, Stanley Mtn, West Vasquez Pass, McClellan Mountain, Gray's Peak (secondary impacts), and Guanella Pass. Of these, James Peak and Guanella Pass are common to all alternatives. In addition, fragmentation would occur along 25 miles of new construction.

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Alternative C. This alternative would potentially impact 2 Conservation Sites as defined herein: James Peak and Guanella Pass. Both of these sites are common to all alternatives. In addition, 9 miles of new trail would fragment habitat. Interpretation of the potential impacts to this alternative is preliminary because this alternative was not totally delineated during our surveys. Therefore we conducted little survey on this alternative route.

Clearly Alternative B will impact more Conservation Sites, therefore potentially impacting highly significant species and ecosystems. In addition, this alternative will fragment the largest amount of minimally impacted areas. Such species as lynx, wolverine, and many game species could be impacted.

Alternative C would impact the fewest Conservation Sites. However, it is reemphasized that additional work is needed to assure that this is an accurate representation of the sensitive features present.

Of these alternatives, we would recommend that Alternative C be chosen. This alternative clearly impacts fewer Natural Heritage Resources and fragments less habitat.

Concern should be noted for the identification of James Peak and Guanella Pass as common junctures for all alternatives. Both of these areas have globally significant species or natural communities occurring within potential impact areas. Whereas the current level of activity at James Peak has not extirpated the rare populations, the future increased use of the area is of great concern. Guanella Pass is already exhibiting impacts to its highly significant wetlands. Braided trails pass very near rare plant species. Dogs were observed roaming the area off leash and hikers walking on and off trail. Several herbaceous wetlands were significantly impacted by heavy foot traffic use. We believe that the threats to the area are high and will increase significantly with the designation of Guanella Pass as a Trail Head for CDNST.

Given the above considerations, we urge the Forest Service to reconsider whether or not these two points must be considered as connecting points for the trail. Given the global significance of both sites and the high sensitivity of Guanella Pass, we recommend that the Forest Service designate other alternatives if they are possible.

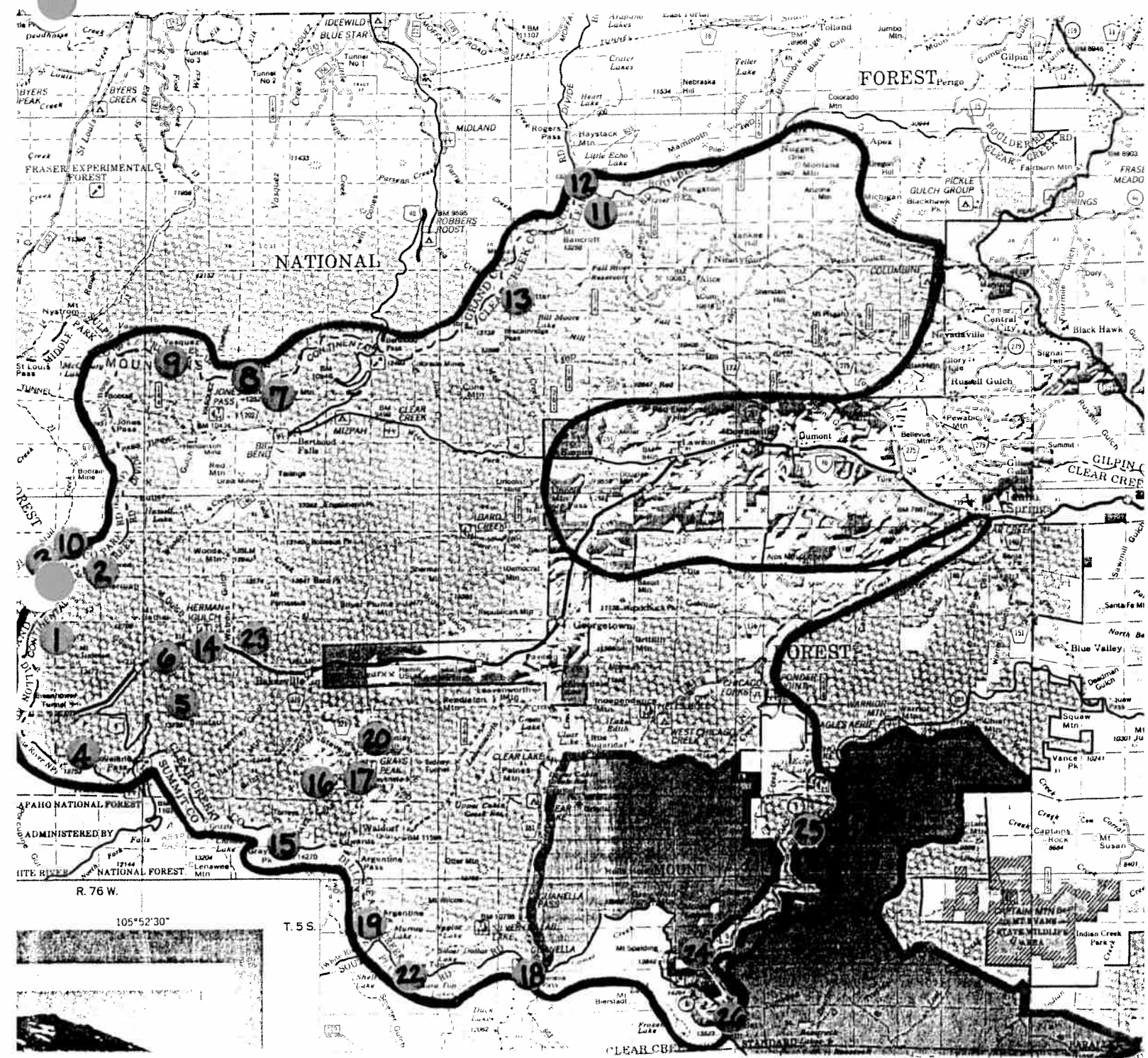


FIGURE 1. MAP OF STUDY AREA AND
—LOCATIONS OF PNAS.

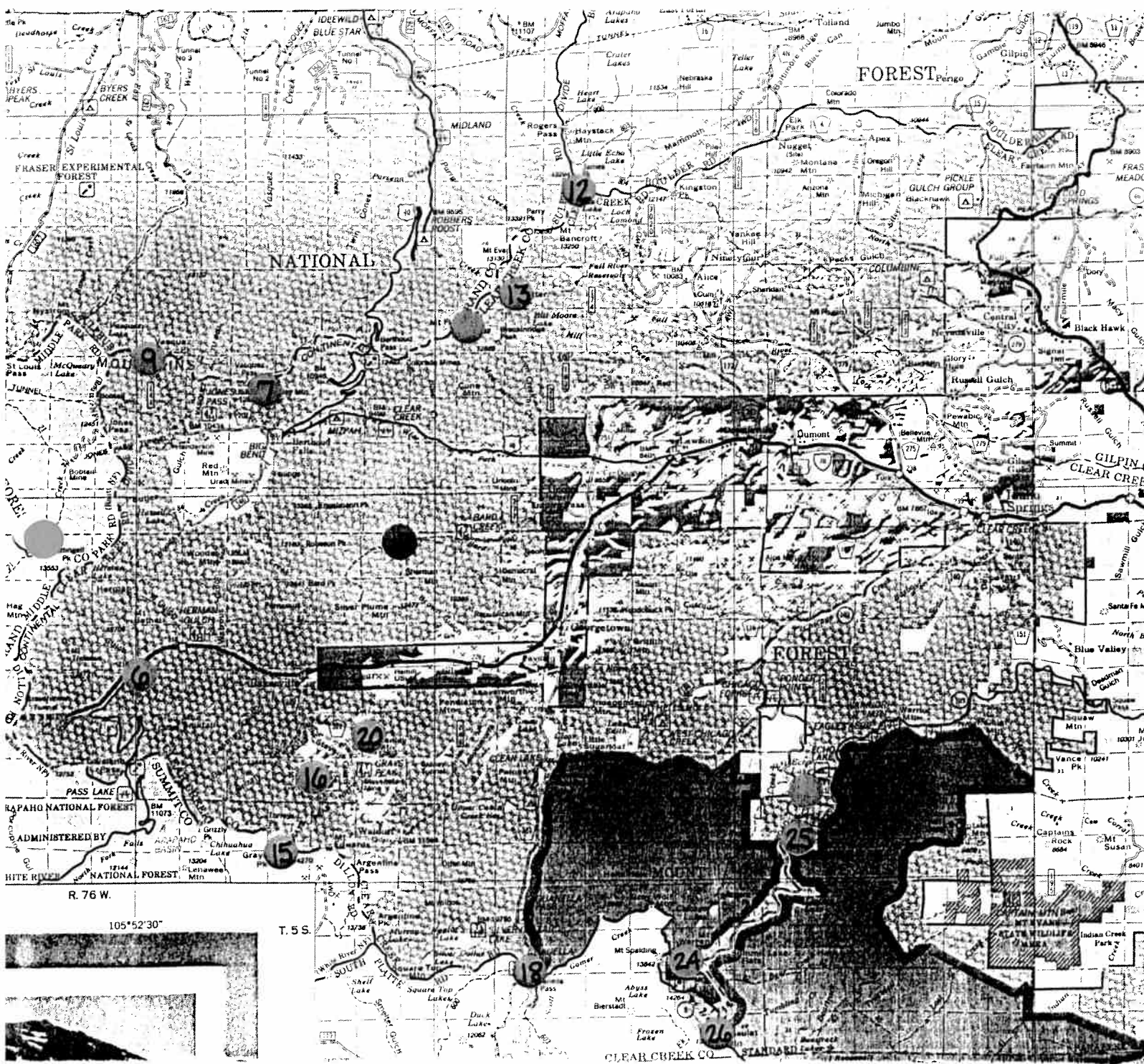


FIGURE 2. MAP OF CONSERVATION
—SITES IN CLEAR CREEK R. D. —

PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT

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The following persons or organizations provided essential information or assistance: Dr. William Weber provided invaluable insight and information from his extensive experience with Colorado's flora; Betsy Neely (The Nature Conservancy, Colorado Field Office), Tom Andrews (RNA Ecologist, TNC/US Forest Service), David Cooper (Colorado State University), Dave Armstrong (University of Colorado Museum), Dave Yamaguchi, Janet Coles (Colorado Natural Areas Program), Dave Weber (DOW), Susan Warner (DOW), Sally White, Tim Hogan (Univ. of Colorado, UCM Herbarium)

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PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT

APPENDIX A

Potential Natural Areas
of the Proposed Continental Divide Trail Corridor
in the Clear Creek Ranger District,
Arapaho-Roosevelt National Forest

PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT

PNA #	PNA NAME	QUADRANGLE	STATUS
1	Dry Gulch Cirque	Loveland Pass	A
2	Herman Lake	Loveland Pass	O
3	Upper Bobtail Creek	Loveland Pass	O
4	Loveland Ridge	Loveland Pass	O
5	Mt. Sniktau	Grays Peak	O
6	Upper Clear Creek	Loveland Pass & Grays Peak	C
7	Stanley Mountain	Berthoud Pass	C
8	Vasquez Pass	Berthoud Pass	A
9	West Vasquez Pass	Berthoud Pass	C
10	Bobtail Creek	Byers Peak	A
11	Loch Lomond	Empire	A
12	James Peak	Empire	C
13	Witter Peak	Empire	C
14	Herman Gulch	Grays Peak	O
15	Grays Peak	Grays Peak	C
16	Kelso Mountain	Grays Peak	C
17	Upper Steven's Gulch	Grays Peak	O
18	Guanella Pass	Mt. Evans	C
19	Argentine Peak	Montezuma	A
20	McClellan Mountain	Grays Peak	C
22	Square Top Mountain	Montezuma	O
23	Watrous Gulch	Grays Peak	O
24	Summit Lake	Mt. Evans & Harris Park	C

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25	Mt. Goliath RNA	Mt. Evans	C
26	Evans-Epaulet Saddle	Mt. Evans	C

PNAs in **boldface** have been included as a Conservation Site. Detailed information on each site is found in **Appendix B**.

- O = Omitted from the study as Conservation Sites. This designation does not imply the lack of conservation value; rather, such sites are prioritized lower than sites known to have rare, sensitive, threatened, or endangered species or exemplary natural communities.
- A = Although no natural heritage resources are known to occur at these sites, additional work is warranted prior to exclusion as a conservation site. One of the most common reasons for this designation is the presence of high quality examples of common natural community types. Until further comparative work is done on these communities, the possibility of their exemplary nature will not be known. Another reason for an "A" designation is the presence of suitable habitat for a cryptic animal or plant species.
- C = Conservation sites that are known to have one or more occurrences of a natural heritage resource. These are Potential Natural Areas that have proven to have conservation significance. Detailed information on each of these sites are included in **Appendix B** along with preliminary conservation planning boundaries.
- X = PNA found to no longer be in a natural state. No such sites were found in this study.

APPENDIX B

Significant Biodiversity areas Identified
During the Inventory

PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT

The 26 PNAs identified during this Natural Heritage Inventory (**Table 1**) were surveyed and subsequently categorized as: (1) Omitted from further consideration; (2) Considered in need of additional survey prior to the need for conservation attention; and (3) Designated as a Conservation Site. A conservation site is any site which contains one or more occurrences, believed to be viable, of a rare species or significant natural community. Therefore, conservation sites have known values for conserving the natural biological diversity of the Arapaho-Roosevelt National Forest.

The conservation sites are described in standard site reports and appear in alphabetical order by conservation site name. The sections of these reports and their contents are outlined and explained below.

SIZE: The approximate acreage included within the conservation planning boundary for the conservation site.

BIODIVERSITY RANK: The overall (global) significance of the conservation site in terms of rarity of the natural heritage resources and the quality (health, abundance, etc.) of their occurrences. As discussed on page 5, these ranks range from B1 (Outstanding Significance) to B5 (General Biodiversity Significance).

LOCATION: The county and USFS 7.5' quadrangles that include the conservation site. The Natural Heritage code for the quadrangle is noted in parentheses (e.g. 3910576 is the Empire quad).

GENERAL DESCRIPTION: A brief narrative picture of the topography, vegetation, and current use of the conservation site. Scientific names are included in the text in parentheses following the common name.

NATURAL HERITAGE RESOURCE SIGNIFICANCE: A synopsis of the rare species and significant natural communities that occur on the conservation site. Many rare species and some natural communities are sensitive to disturbance or may be sought out by collectors; therefore, the exact locations of each element are not shown on the maps. Requests for additional information should be addressed to the CNHP.

CURRENT STATUS: A summary of the ownership (in this case largely USFS owned), degree of protection currently afforded the conservation site, and threats to the site or natural heritage resources as determined to date.

BOUNDARY JUSTIFICATION: The conservation planning boundary delineated in this report includes all known occurrences of natural

PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT

heritage resources and the adjacent lands required for their protection. A discussion of the major factors that were considered is on pages iii-vi.

PROTECTION AND MANAGEMENT CONSIDERATIONS: A summary of the major issues and factors that are known or likely to affect the protection and management of the conservation site.

PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT

Table 3. Conservation sites identified during the Clear Creek Ranger District Natural Heritage Inventory.

<u>Conservation Site</u>	<u>Biodiversity</u>		<u>USGS Quadrangle</u>
	<u>Rank</u>	<u>PNA #</u>	
Bard Creek	B3	N/A	Grays Peak
Evans-Epaulet Saddle	B4	26	Mt. Evans
Grays Peak	B3	15	Grays Peak
Guanella Pass	B2	18	Mt. Evans
James Peak	B3	12	Empire
Kelso Mountain	B3	16	Grays Peak
McClellan Mountain	B5	20	Grays Peak
Mt. Flora	B4	N/A	Empire
Mt. Goliath RNA	B3	25	Mt. Evans
One-O-Three Cross Five	B3	N/A	Idaho Springs
Stanley Mountain	B3	7	Berthoud Pass
Summit Lake	B3	24	Mt. Evans
Upper Clear Creek	B5	6	Loveland Pass & Grays Peak
West Vasquez Pass	B4	9	Berthoud Pass
Witter Peak	B3	13	Empire

PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT

EVANS-EPAULET SADDLE

SIZE: ca. 74 acres

BIODIVERSITY RANK: B?

LOCATION: Clear Creek County
Mt. Evans Quadrangle (3910556)

GENERAL DESCRIPTION: The Evans-Epaulet Saddle site is located in the saddle between the two mountains appearing in the name. The Mt. Evans road bounds the north edge of the conservation site, the downward or upward slopes bounding the other aspects. The area is flat to very gently sloping with wet to saturated soils. The elevation is 13,000' and therefore the vegetation is composed of tundra species. Evidence of frost heaving is common. Apparently, snow remains on this site until well into June. There is little evidence of human disturbance except at the western edge where foot travel (apparently to Epaulet Mountain) has formed a poor trail.

NATURAL HERITAGE RESOURCE SIGNIFICANCE: Such high elevation wetlands are often of interest, but more so on calcareous soils. However, at this site, poorly explored as it is, the state-rare saxifrage (Saxifraga foliolosa) occurs. The occurrence became known through a specimen in the Iowa State University Herbarium (William Weber, pers. comm.). This species is only known in Colorado from the shore of Summit Lake, 1.5 air miles to the north. This site should be considered a high priority for thorough botanical survey.

Element	Common Name	Occurrence Rank	Global Rank	State Rank	Federal Status	State Status
<u>Saxifraga foliolosa</u>	Leafy saxifrage	B	G4	S1	-	List 3

CURRENT STATUS: Most of the conservation site is not designated for special protection. However, ca. the southern two thirds of the site is within the boundary of the Mt. Evans Wilderness. The Department of Transportation right-of-way is within the northern part of the site.

BOUNDARY JUSTIFICATION: The conservation planning boundary incorporates the entire saddle between Mt. Evans and Epaulet Mountain. The rare plant location is included within the recommended area. As the slope quickly steepens in all directions, little buffer is included with the exception of the northern border. On the north the Mt. Evans road passes. Because of the potential impacts of foot traffic, part of the road's right-of-way and a crude parking area are included in the planning boundary.

PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT

PROTECTION AND MANAGEMENT CONSIDERATIONS: The high quality condition of the site suggested that few humans intrude on the area. However, a parking area near the northwest corner of the site allows some foot access to the area. Most of the hiking apparently move along the western edge of the site and onto Epaulet Mountain. Foot traffic should be guided from the wetlands of this saddle. While we do not recommend a special designation for the site, since comprehensive inventory is still needed, monitoring of the wetland's conditions and the status of the rare saxifrage is warranted. Road maintenance is not generally considered a threat; however, consideration should be given to protecting the site from road runoff during the application of chemicals (e.g. tar). Road construction should not intrude further into the conservation site and should prevent siltation and runoff into the wetlands.

442

40'

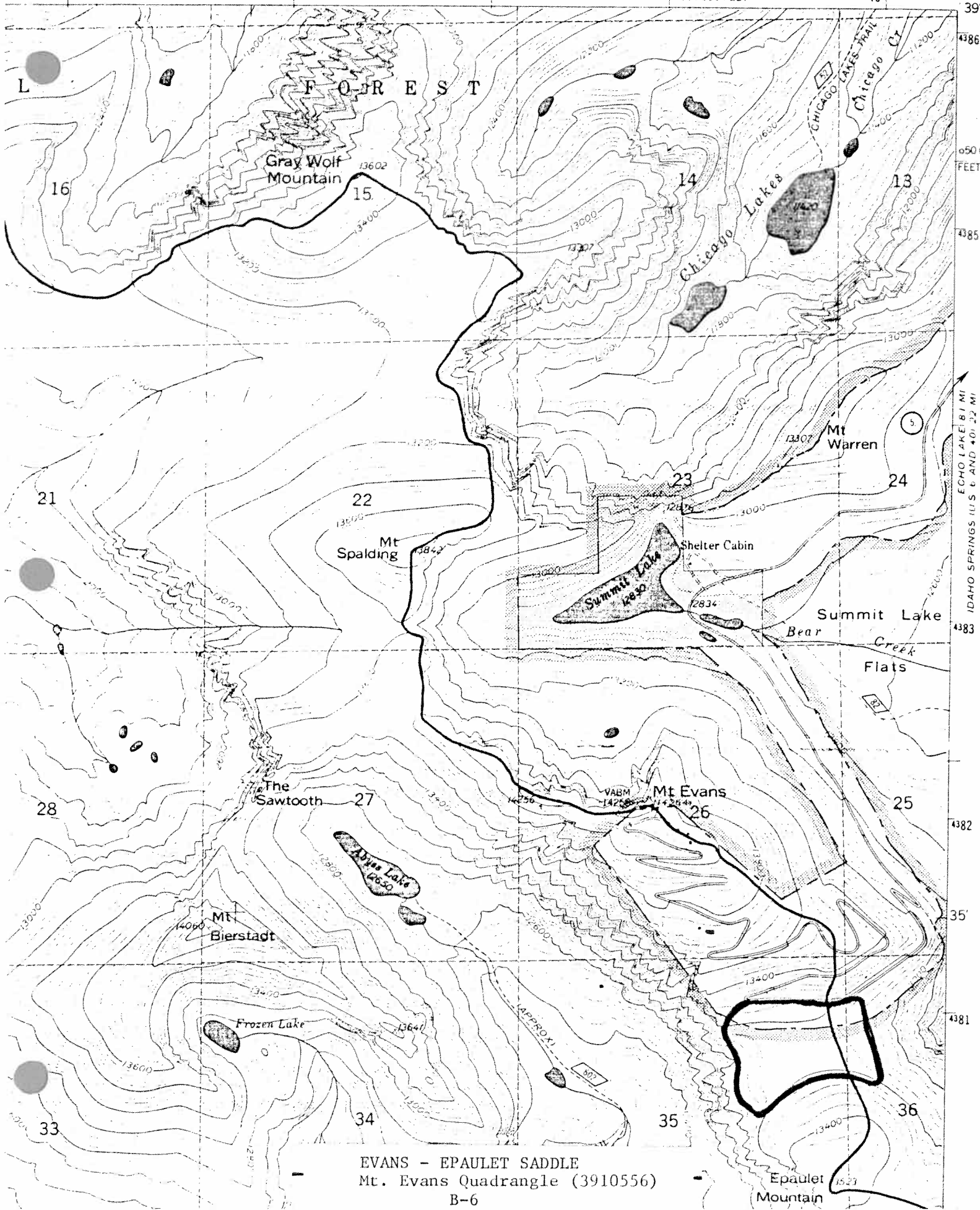
443

444

1960 000 FEET

446

105°37'30"
39°3'



EVANS - EPAULET SADDLE
Mt. Evans Quadrangle (3910556)
B-6

Epaulet
Mountain

PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT

GRAYS PEAK

SIZE: ca. 600 acres

BIODIVERSITY RANK: B3

LOCATION: Clear Creek and Summit counties
Grays Peak Quadrangle (3910567)

GENERAL DESCRIPTION: The site is a high elevation massif with two peaks exceeding 14,000 feet. Both of the peaks are composed of scree, talus, blocky talus with outcrops of bedrock. The harsh conditions result in little vegetation on the peaks. Where vegetation exists it is primarily small mossy tundra areas. Opportunistic species inhabit areas where soil has accumulated. The saddle between the peaks has small areas of turf, meadow vegetation, and rocky areas with snowbed patches. The area is spectacular and rugged.

NATURAL HERITAGE RESOURCE SIGNIFICANCE: The very high elevation and talus substrates are inhabited by three rare plant species. This is a large concentration for alpine habitats on acidic rock. The area is extremely rugged and deserving of additional searches where other occurrences or individuals of rare species may be located.

Element	Common Name	Occurrence Rank	Global Rank	State Rank	Federal Status	State Status
<u>Ranunculus gelidus</u>	Tundra buttercup	-	G4	S1	-	3
<u>Draba grayana</u>	Gray's Peak whitlow-grass	-	G2	S1	-	4
<u>Crepis nana</u>	Dwarf hawksbeard	B	G5	S2	-	2

CURRENT STATUS: The entire area is within the National Forest boundary. The area is given no special designation.

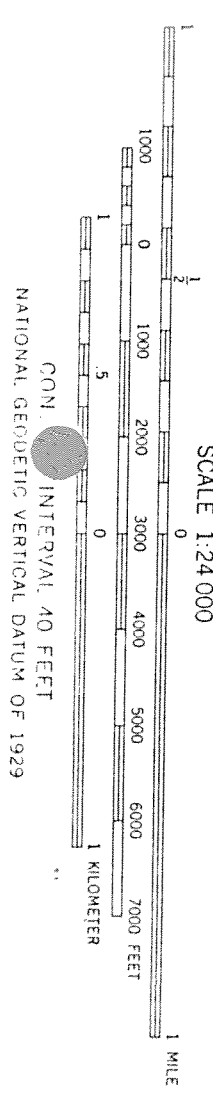
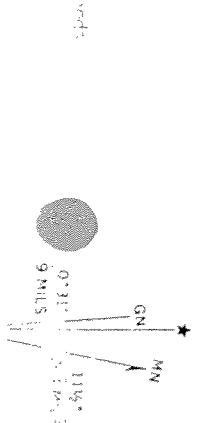
BOUNDARY JUSTIFICATION: The boundary includes all of the known element occurrences and some buffer. The extensive talus and scree habitat between known occurrences is incorporated and likely contains additional individuals of rare species.

PROTECTION AND MANAGEMENT CONSIDERATIONS: Several of the populations of rare species are currently threatened from the intensive trail use. Grays and Torreys peaks are among the most popular of Colorado's fourteeners and sustain heavy hiker use. The substrate on the mountains present difficulties in marking the trails. Multiple routes through the scree directly threaten rare

PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT

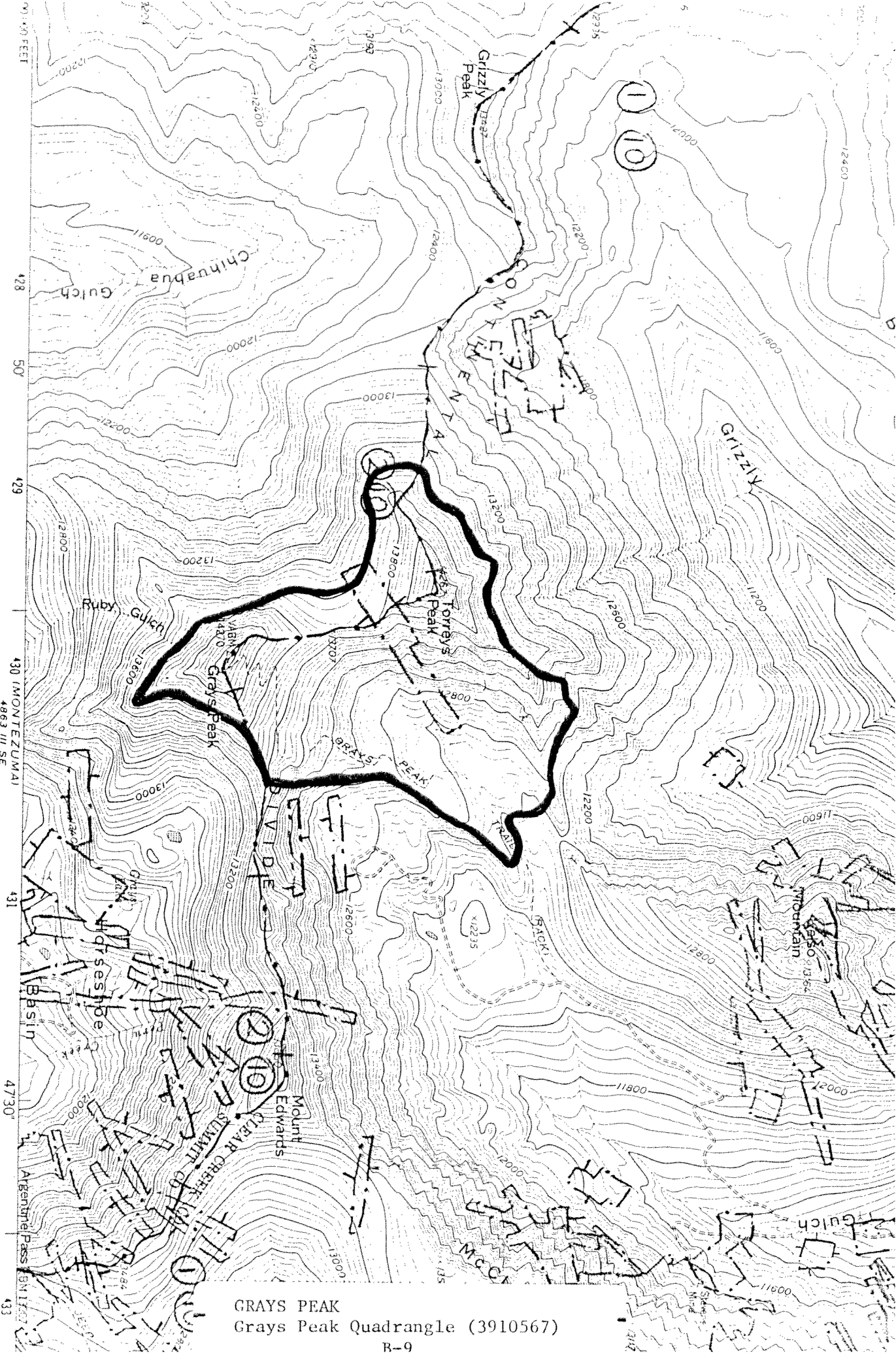
species and may very well eliminate some of these species without protective actions. Routing of the Continental Divide Trail through the area would probably increase the trail use and subsequently the threats to the rare species.

The large numbers of rare species on the two peaks indicate the significance of the area. Such a site should be considered a candidate for designation as a Special Interest Area for its botanical significance. Protection of the SIA should include informational and directional signs. Construct of a well-marked trail and monitoring activity should be considered. Some tread may need to be rerouted away from known occurrences of rare plants where possible. Since the only observed threat to the plants is from wandering hikers, trail design is of utmost importance to the welfare of these populations. A monitoring program should be established as soon as possible.



CON. INTERVAL 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

SCALE 1:24,000



GRAYS PEAK
Grays Peak Quadrangle (3910567)

PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT
GUANELLA PASS

SIZE: ca. 1600 acres

BIODIVERSITY RANK: B2

LOCATION: Clear Creek County
Mt. Evans Quadrangle (3910556)

GENERAL DESCRIPTION: Guanella Pass proper passes between two large and significant wetland areas. Benches and swales begin just off the roadway. The conservation site is divided into two unequal areas by the road. To the west of the pass is the headwaters of Duck Creek. To the east of the road is gently sloping bench between the headwaters of South Clear Creek and Scott Gomer Creek. Water is generally near or on the surface and causes several distinct vegetation types in a complex mosaic. First and most dominant are dense shrub communities, largely composed of willows (Salix brachycarpa and S. planifolia with an occasional dense understory of graminoids and herbs. Second, several ponds occur, varying in size from tiny to approximately 12 acres. Third, around several ponds and occasionally independent of them are small marshes. These areas are composed largely of carices. Snowmelt is probably the primary water source. Finally, wet meadows are common in several areas including benches above Scott Gomer Creek. These areas are generally drier than marshes, but may retain some water. This site contains some of the most extensive treeline shrub communities in the Front Range.

NATURAL HERITAGE RESOURCE SIGNIFICANCE: Guanella Pass is inhabited by state-rare plant species, each more common in northerly regions. The moss, Paludella squarrosa, is known in Colorado only from this site (Cooper, 1991). Eriophorum gracile is known from not more than 6 site in Colorado. The most significant biodiversity feature of the Guanella Pass site is the extensive willow carrs and associated habitats. The CNHP considers these exemplary examples of this community. The dominant plant association is the Salix planifolia-Salix brachycarpa/Caltha leptosepala. Other important communities include the Carex rostrata wetlands and the Carex aquatilis wetlands. While these communities are not considered rare, again the examples at the Guanella Pass site are of very high quality. In addition to rare species, the area is known for its large wintering population of white-tailed ptarmigan. It is noteworthy that during one of our visits to this site, the migrating warblers were extremely abundant. The significance of high elevation willow thickets to migrating birds is not understood, but may be important.

PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT

Element	Common Name	Occurrence Rank	Global Rank	State Rank	Federal Status	State Status
<u>Eriophorum gracile</u>	Slender cotton grass	B	G5	S2	-	3
<u>Paludella squarrosa</u>	a moss	B	G?	S1	-	-
<u>Salix planifolia</u> - <u>Salix brachycarpa</u> / <u>Caltha leptosepala</u>	a willow carr	A	G4	S4?	-	-

CURRENT STATUS: No protective status is given to the conservation site. The national forest boundary between the Pike and Arapaho national forests passes through the site. Much of the area on the east side of the road is contained within the Mt. Evans Wilderness Area; however, that portion on the west of the road does not. The area is heavily visited by casual and serious hikers. There is evidence of human traffic deep within the willow thickets, particularly near several of the larger ponds. Cross-country skiing is popular during the winter. This pass is heavily used by White-tailed ptarmigan during the winter.

BOUNDARY JUSTIFICATION: The conservation planning boundaries for Guanella Pass include all element occurrences for rare plants and additional areas that may contain these species. The boundary also incorporates the extensive willow community. A minimum buffer is considered within the boundary since all of the upstream watershed for the east side of the road is within a wilderness area. The landscape in which the conservation site occurs varies from wilderness area (the vast majority) to public road access at Guanella Pass. Of course the ecological boundaries of this site extend to the watershed limits. Since wilderness designation provides the strongest protection for an area needing limited active management, the conservation planning boundary should be considered the minimum are required for protection of the rare and significant features. A designation, as on RNA, should consider boundaries extending to watershed limits.

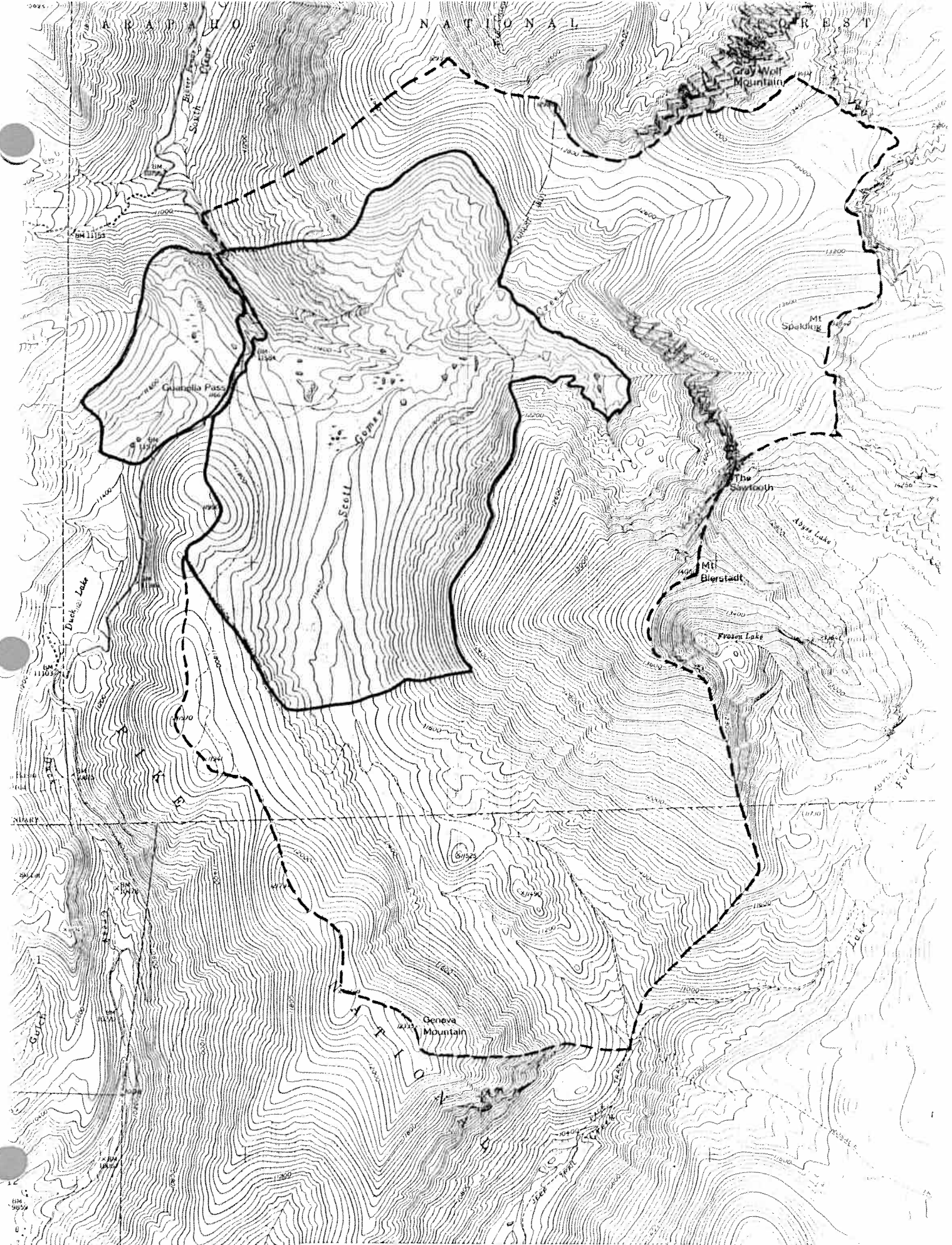
PROTECTION AND MANAGEMENT CONSIDERATIONS: The Guanella Pass area is intensively used due to its easy accessibility. Any Forest activities that would increase the use of the area should be planned carefully to protect the significant elements of natural diversity. Should the Continental Divide Trail extend through the pass, higher use of the sensitive habitats is expected. Threats also exist from road maintenance activities. Road realignment or widening could seriously alter the hydrology of the area and subsequently threaten the rare plants of the site.

PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT

Due to the significance of Guanella Pass to the Forest's and state's biodiversity, we recommend that the portion of the site to the east of the road be considered as a candidate Research Natural Area. The area is an exemplary natural community that contains significant rare species. In addition, the high quality part of the Guanella Pass conservation site to the west of the road should be considered as a candidate for designation as a Special Interest Area (botanical and ecological).

Protection of the Guanella Pass site should include a redesigning of any trails through the area. We strongly recommend that other alternatives to the Pass be considered. Should the Continental Divide Trail pass through Guanella Pass, camping should not be allowed within the conservation planning boundaries unless safe sites can be determined. Mountain goats are known to use the area. Since this species is not native to the area, careful observation should be made to assess any potential negative impacts. Trampling within the wetlands of the site should be curtailed. Monitoring programs should be implemented for the rare plants. The Forest Service should work with DOT to minimize threats to the area from road maintenance activities. Although conservation planning boundaries have not been extended to watershed limits, acknowledgement of the significance of watersheds to this site should be recognized in the Forest Planning Processes. Such consideration is an integral part of the Ecosystem Management guidelines issued from the Chief of the U. S. Forest Service, 1992.

The activities of the proposed Continental Divide Trail corridor present additional threats to the Guanella Pass area. In the short term these threats would probably be of moderate significance; however, due to the global significance of this area, the long term threats are considered severe. The rare plant species, Eriophorum gracile and Paludella squarrosa are considered more seriously threatened than the communities in the short term due to their proximity to the Pass proper, i.e. their accessibility is greater and they are represented by small populations.



GUANELLA PASS
Mt. Evans Quadrangle (3910556)

PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT

JAMES PEAK

SIZE: ca. 200 acres

BIODIVERSITY RANK: B3

LOCATION: Clear Creek, Gilpin, and Grand counties
Empire Quadrangle (3910576)

GENERAL DESCRIPTION: The James Peak site is a rocky mountain peak that reaches an elevation of 13,294'. The peak drops off dramatically into steep cirque walls/cliffs on the west and east sides. The south face is rocky and bouldery frost-heave and patterned ground. The patterned ground is a mosaic of boulder and rock fields with graminoid-dominated turfs. There is water flowing under the rocks in several areas, surfacing for short runs. The drier convex slopes have Silene agraulis fellfield vegetation with cushion plants. The saddle and lower slopes are dominated by Kobresia meadows.

NATURAL HERITAGE RESOURCE SIGNIFICANCE: Two species of globally rare mustards are known from James Peak, one of which is known from fewer than 10 sites worldwide.

Element	Common Name	Occurrence Rank	Global Rank	State Rank	Federal Status	State Status
<u>Draba porsildii</u>	Porsild draba	B	G3	S1	-	3
<u>Draba grayana</u>	Gray's Peak whitlow-grass	B	G2	S?	-	4

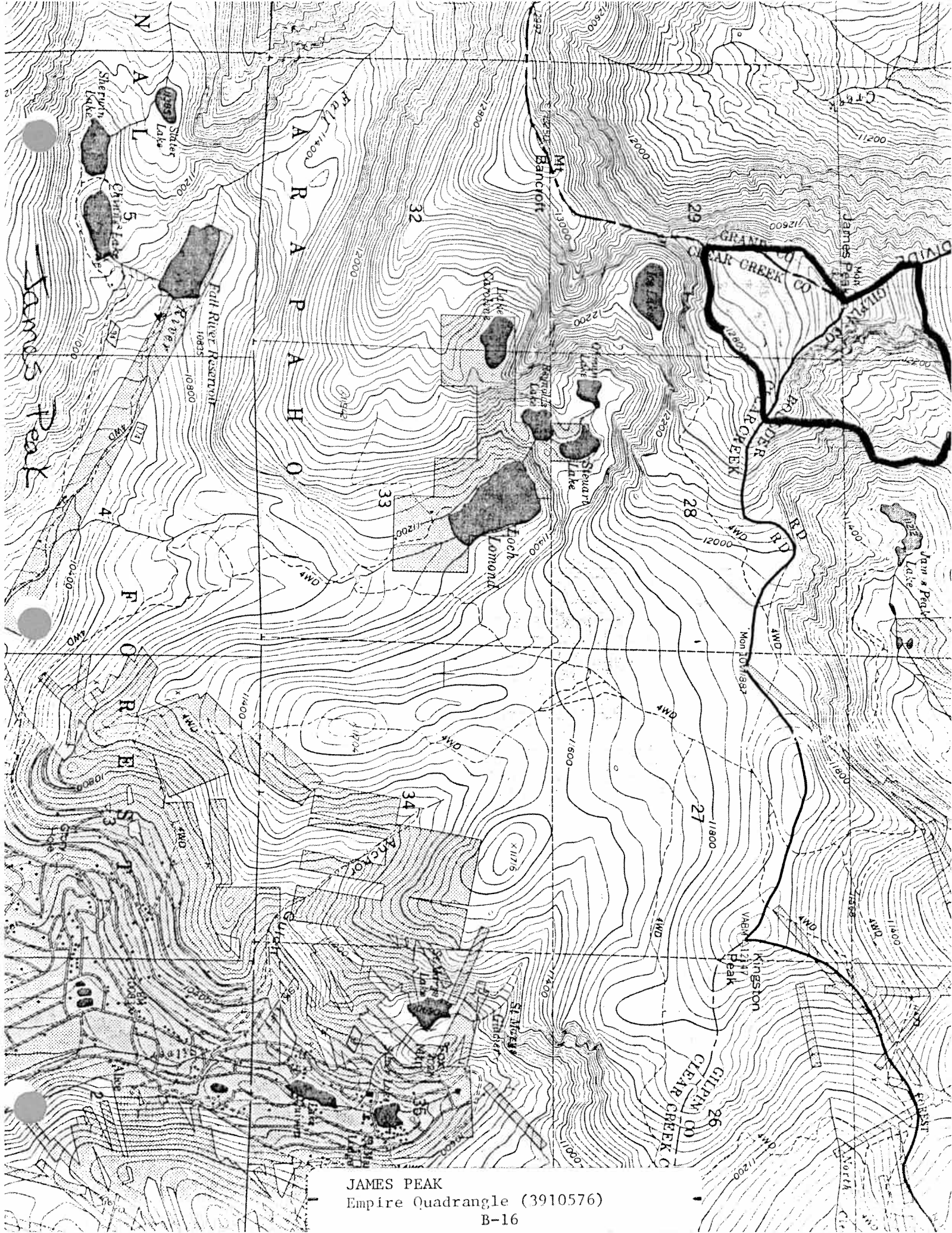
CURRENT STATUS: The James Peak site was historically mined heavily. A dirt road passing into the area is closed, but continues to have people drive around and into the area. The area is used by a large number of recreationists and nature observers. No special status designation for this area exists. Threats exist if mining becomes economically feasible and from increased hiking (especially if scattering into the rockier areas).

BOUNDARY JUSTIFICATION: The preliminary conservation planning boundary includes the known occurrences of the two globally rare Draba species, adjacent similar habitat, and a buffer. These small species may be found over a wider area than we know them from now, but intensive surveys will be necessary to determine the full extent of the occurrences.

PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT

PROTECTION AND MANAGEMENT CONSIDERATIONS: Searches did not reveal either of the Draba species. We recommend that the planning boundaries be used to evaluate potential impacts to these species in the planning processes of the Forest. No special designations are recommended at this time; however, efforts should be made to relocate these globally rare species and determine if special designation is appropriate for sites. Threats to the two Draba species known to occur at the site are considered low in the case of D. grayana and moderate for D. porsildii. However, it is noted that increased traffic off-trail would pose serious threats to these globally significant plant species.

Observations indicated that the blocking of the four-wheel drive road is not effective, resulting in the continued disturbance of the alpine habitat of James Peak.



JAMES PEAK
Empire Quadrangle (3910576)
B-16

PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT

KELSO MOUNTAIN

SIZE: ca. 40 acres

BIODIVERSITY RANK: B5

LOCATION: Clear Creek County
Grays Peak Quadrangle (3910567)

GENERAL DESCRIPTION: Kelso Mountain is a north-south trending ridge from 12,500 feet at the saddle to 13,164 feet at the peak. The east slope is less steep than the west which has abundant cliff faces. The east slope is dominated by graminoids, in some areas Carex rupestris and C. elynoides, and on the lower slopes by taller grasses such as Deschampsia. The east slope has diverse vegetation. The ridge line is somewhat undulating with the highest points in areas of bedrock outcrops. The lower points are loose, sandy, and rocky scree slopes between the rocky outcrops and the cliffs.

NATURAL HERITAGE RESOURCE SIGNIFICANCE: Kelso Mountain is inhabited by two state-rare plant species, Askellia nana and Aquilegia saximontana.

Element	Common Name	Occurrence Rank	Global Rank	State Rank	Federal Status	State Status
<u>Crepis nana</u>	Dwarf hawksbeard	B	G4	S2	-	-
<u>Aquilegia saximontana</u>	Rocky Mountain columbine	B	G2G3	S2S3	-	-

CURRENT STATUS: No special protective status is provided this site. A portion of the site may be privately owned.

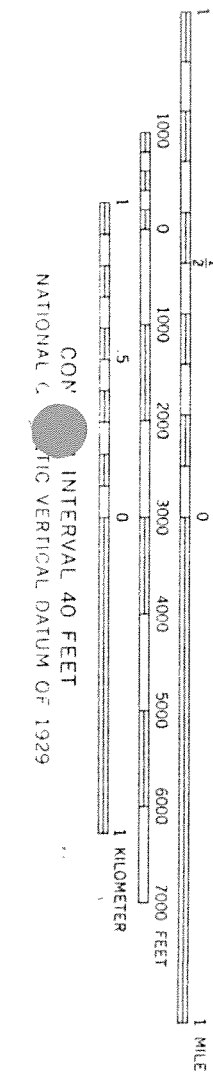
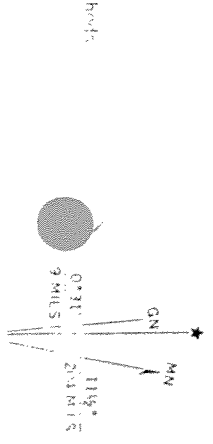
BOUNDARY JUSTIFICATION: The conservation planning boundaries include all of the observed element occurrences and the adjacent scree and rock outcrop habitat. The area occurs on a ridge line, therefore hydrological concerns are minimized.

PROTECTION AND MANAGEMENT CONSIDERATIONS: No immediate threats to the area were observed with the relatively light load of foot traffic. The locations of these plants may not be particularly susceptible to human impacts. However, it is recommended that increased trail use not be encouraged. One population of rare plants is only 20 meters from the peak of Kelso Mountain. Should development of a trail in the vicinity be encouraged, these species could face more serious threats.

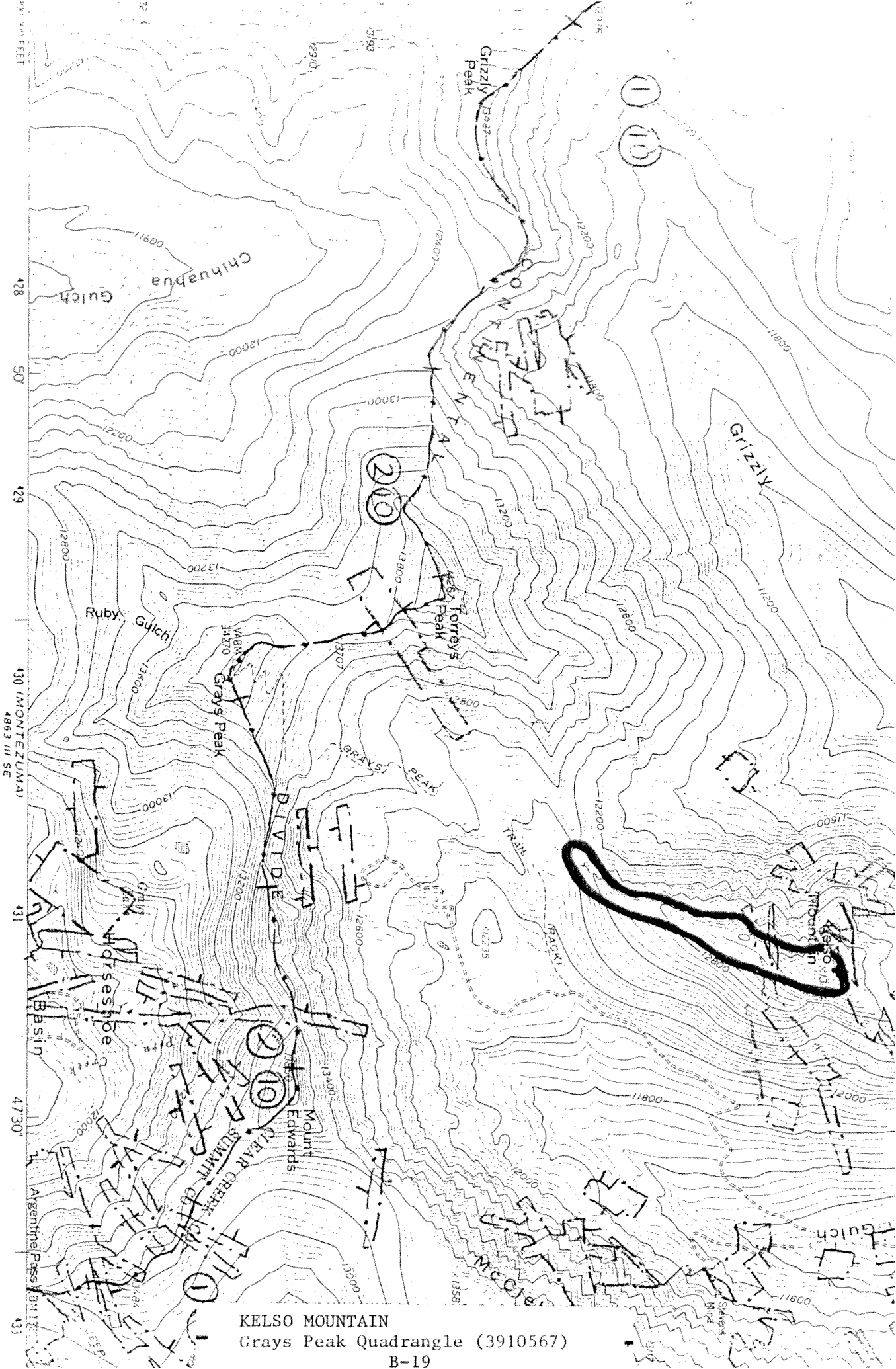
PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT

No recommendations for special designations are warranted at this time. The Forest Service should protect this site through monitoring of the rare plant populations. The impacts of the introduced wandering Mountain goats are unknown. However, digging within the sandy pockets inhabited by a rare plant may pose a threat. Impacts of the goats should be determined.

Immediate threats posed by the proposed Continental Divide Trail corridor are considered low for the Aquilegia saximontana because of its inaccessible habitat. Should heavy foot traffic occur on Kelso Mountain the Crepis nana population could be seriously threatened.



SCALE 1:24,000
INTERVAL 40 FEET
NATIONAL C. T. VERTICAL DATUM OF 1929



KELSO MOUNTAIN
Grays Peak Quadrangle (3910567)
B-19

PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT

McCLELLAN MOUNTAIN

SIZE: ca. 32 acres

BIODIVERSITY RANK: B5

LOCATION: Clear Creek County
Grays Peak Quadrangle (3910567)

GENERAL DESCRIPTION: A long north-south trending ridge with a nearly shear west face and steep east face. The elevation rises from 12,600 to 13,500 feet. The ridgetop has outcrops of bedrock with dips and saddles between. The outcrops are vegetated on the east with typical cushion plant/fellfield communities. The west slopes are inhabited by few plants. The low-lying areas between outcrops generally have decomposed granite screes to the west. These screes have sparse plants.

NATURAL HERITAGE RESOURCE SIGNIFICANCE: A single population of Crepis nana was located at this site. This species is known from less than ten sites in Colorado.

Element	Common Name	Occurrence Rank	Global Rank	State Rank	Federal Status	State Status
<u>Crepis nana</u>	Dwarf hawksbeard	B	G5	S2	-	-

CURRENT STATUS: Portions of this site are privately owned. There is no special protection given this area.

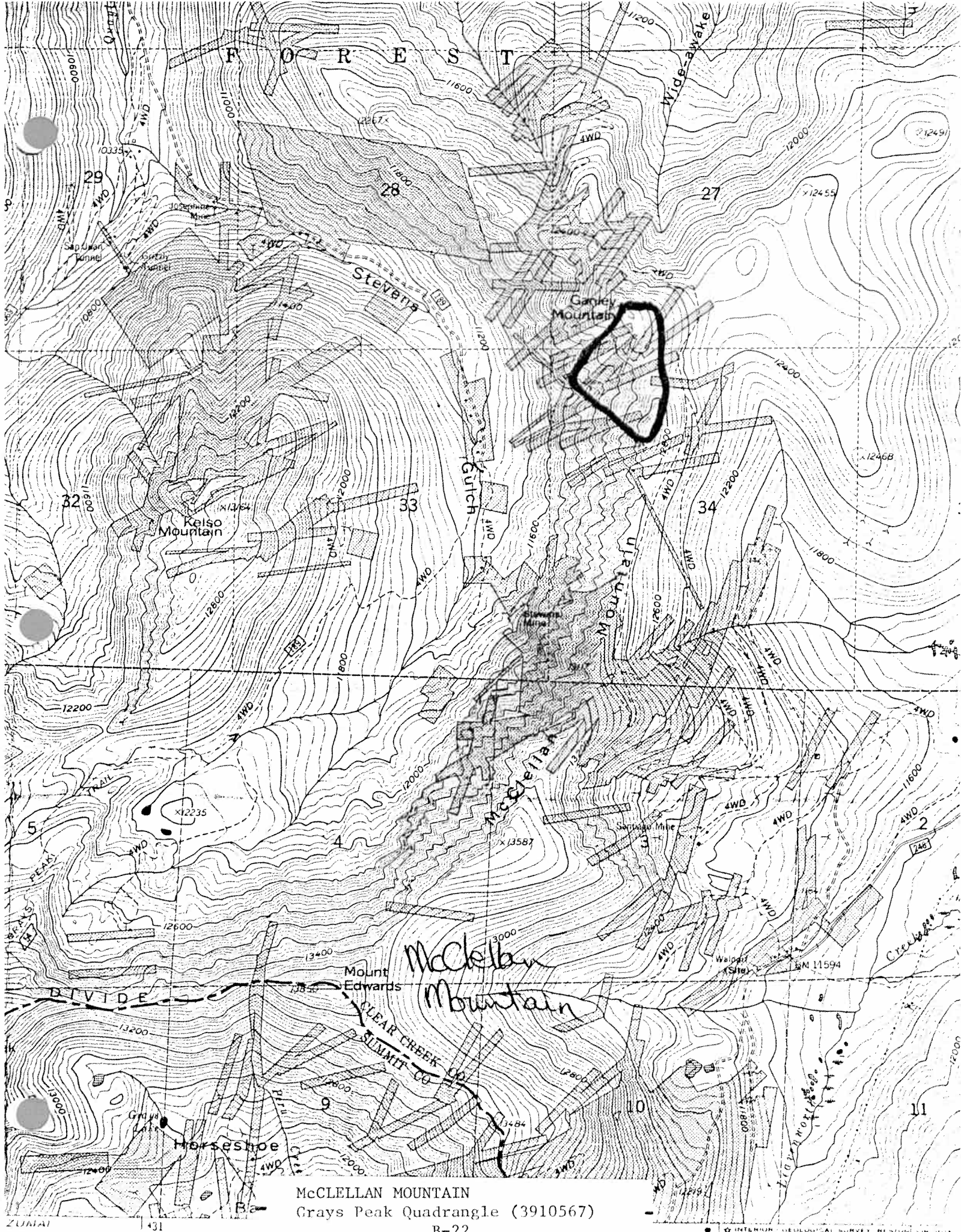
BOUNDARY JUSTIFICATION: The conservation planning boundary includes all known individuals of Crepis along with an upslope and slight downslope buffer. Inholdings are included within the conservation boundaries.

PROTECTION AND MANAGEMENT CONSIDERATIONS: Past mining activities have impacted the site, but the population of Crepis nana remains. At least a portion of the occurrence is privately owned. Recreational activity is currently moderate with the heaviest use on the old road bed. Protection of this population will be difficult given the complex ownerships. The development and enhancement of trails in the area should avoid direct and secondary impacts to the population of rare plants. While no special designation is recommended at this time, the Forest is urged to consider this population in its planning activities. Opportunities to consolidate land ownership within the conservation planning boundaries should be considered.

The population of Crepis nana known from this site is considered moderately threatened from the proposed Continental

PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT

Divide Trail corridor. Placement and maintenance of the trail corridor is considered critical to the long term existence of this species on Kelso Mountain.



McCLELLAN MOUNTAIN
Grays Peak Quadrangle (3910567)

PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT

MT. FLORA

SIZE: ca. 43 acres

BIODIVERSITY RANK: B4

LOCATION: Clear Creek County
Empire Quadrangle (3910576)

GENERAL DESCRIPTION: The Mt. Flora site is a high elevation peak ranging from 12,800' to 13,100' situated on an east to west trending section of the Continental Divide. The ridge is rocky and windswept. The eastern and southern faces of the peak area are steep cliffs forming the headwall of cirques. The western and northern faces are less steep and rocky. The vegetation is predominantly fellfield with cushion plants. Better developed turf communities occur in patches. On the lee slopes are snowfield patches with several areas of saturated soils. The vegetation of such wet areas is sparse, indicating very late melting of snow. In the topography of the peak are small south- and west-facing gravelly screes above cliffs and rock outcrops. Most of the areas are unstable and hazardous. One area nearest the Mt. Flora Peak was inhabited by a population of Erigeron humilis. The lower slopes, west- and north-facing, have well-developed, extensive areas of graminoid-dominated vegetation.

During the preliminary identification phase, this conservation site was originally included in the James Peak PNA, but it was determined that it should be considered separately. Thereafter, no PNA number was applied.

NATURAL HERITAGE RESOURCE SIGNIFICANCE: This conservation site contains one of only two sites in Colorado for the species. [Note that the identification is based on several weakly flowering individuals and should be confirmed in the next field season.]

Element	Common Name	Occurrence Rank	Global Rank	State Rank	Federal Status	State Status
<u>Erigeron humilis</u>	Low fleabane	B	G4	S1	-	2

CURRENT STATUS: The entire area is owned by the U. S. Forest Service. No special designation is given to this site. The site is within a proposed routing of the Continental Divide Trail.

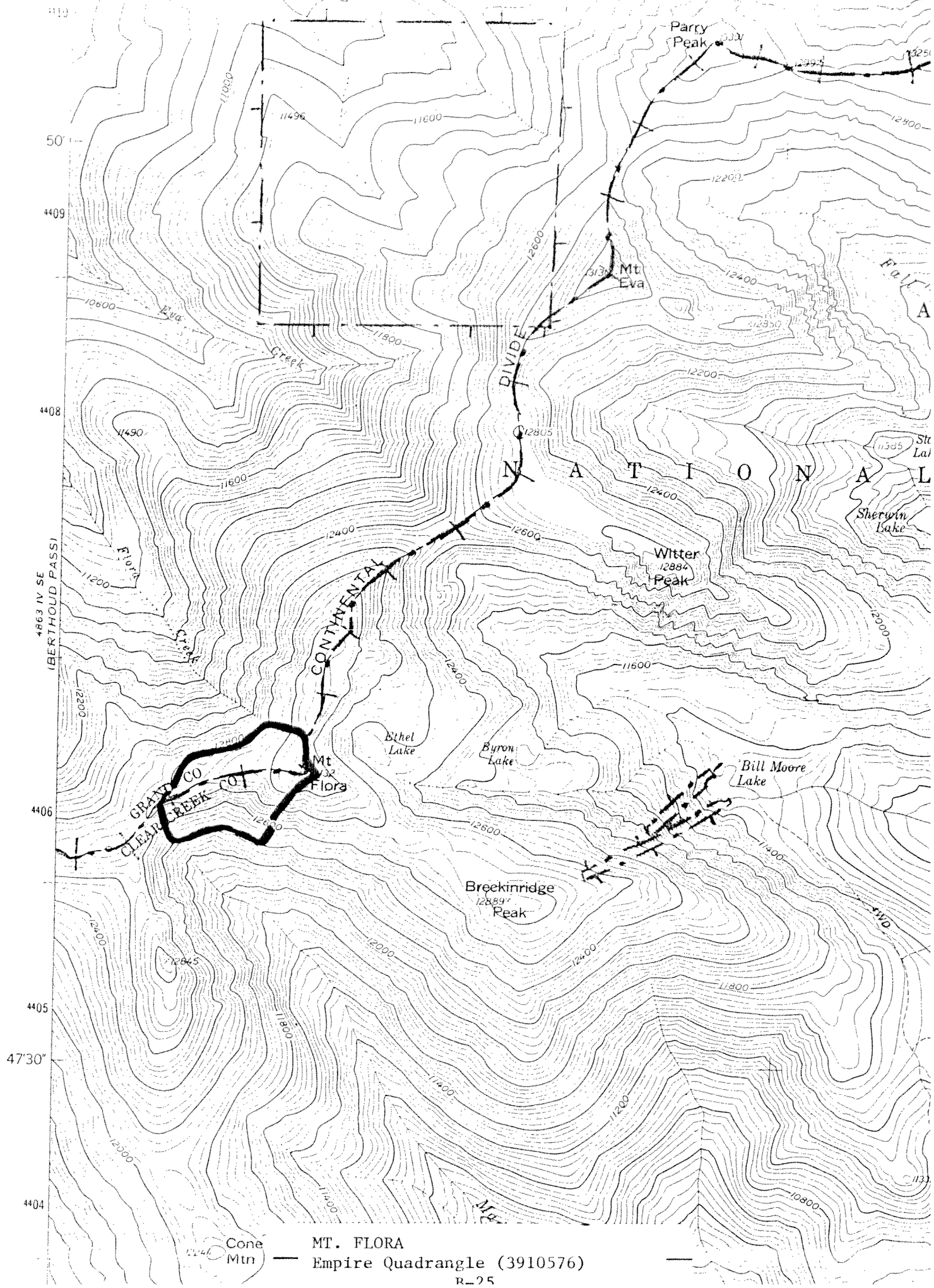
BOUNDARY JUSTIFICATION: The preliminary conservation planning boundary includes all known individuals of the state-rare plant,

PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT

Erigeron humilis. Also included within the boundary is all of the similar adjacent habitat that would support the local ecological processes.

PROTECTION AND MANAGEMENT CONSIDERATIONS: This remote area is of high quality with few impacts observed. The area is proposed as a route for the Continental Divide Trail. Any trail development in the area has the potential to degrade this already small population. Should this be a chosen route, trail placement should avoid direct and anticipated indirect impacts from construction or hiker use. The population should be monitored and additional survey of the surrounding area conducted. Pending a confirmation of the rare plant's identification, we recommend that this conservation site be considered for designation as a Special Interest Area.

The placement of any trails of the proposed Continental Divide Trail and the resultant activities are believed to be of moderate threat to this rare species. Since the population of the state-imperilled Erigeron humilis is so close to the peak, the long term chances of impact may be significant.



PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT

MT. GOLIATH RNA

SIZE: ca. 740 acres

BIODIVERSITY RANK: B3

LOCATION: Clear Creek County
Idaho Springs Quadrangle (3910565)

GENERAL DESCRIPTION: The Mt. Goliath RNA is on an east- and southeast-facing slope of Goliath Peak, at and just above treeline (elevations from ca. 11,100-12,216'). The area includes a large amount of Bristlecone pine with varying amounts of Subalpine fir. In much of the area, the fir is the dominant. Additional portions of the RNA include alpine habitats. Access is gained from a crude parking area along the Mt. Evans road. A poorly developed trail passes through the area. Regenerating Bristlecone pine appears good, especially on the south-facing slopes near treeline. The understory is in good shape with little evidence of off-trail users except near the trail head.

NATURAL HERITAGE RESOURCE SIGNIFICANCE: This Research Natural Area was designated as a high quality example of bristlecone pine habitat. Although impacted on its periphery, this area maintains a high level of integrity.

Element	Common Name	Occurrence Rank	Global Rank	State Rank	Federal Status	State Status
<u>Pinus aristata</u> / <u>Trifolium dasyphyllum</u>	Bristlecone pine/ Whiproot clover plant association	B	G2	S2	-	-

CURRENT STATUS: The Mt. Goliath Research Natural Area was established in 1950 as a representative of its cover type. It is completely owned by the U. S. Forest Service. The area is impacted from wandering hikers beginning from the parking area on the Mt. Evans Road. Downed limbs and trees, expected in such old growth stands of bristlecone pine, are rare to uncommon throughout much of the area. Firewood collecting has been and continues to be a threat and detrimental impact, fostered by the proximity to the road. We noted a network of poorly developed trails and litter in the proximity of the parking area. A Mt. Evans information booth was placed in the parking area in 1992, increasing the local use of the RNA. Threats to the area may increase with development of the Mt. Evans Corridor.

BOUNDARY JUSTIFICATION: The boundary of the RNA was established by the Forest Service. Such a boundary of convenience does not incorporate the ecological boundaries and processes needed to

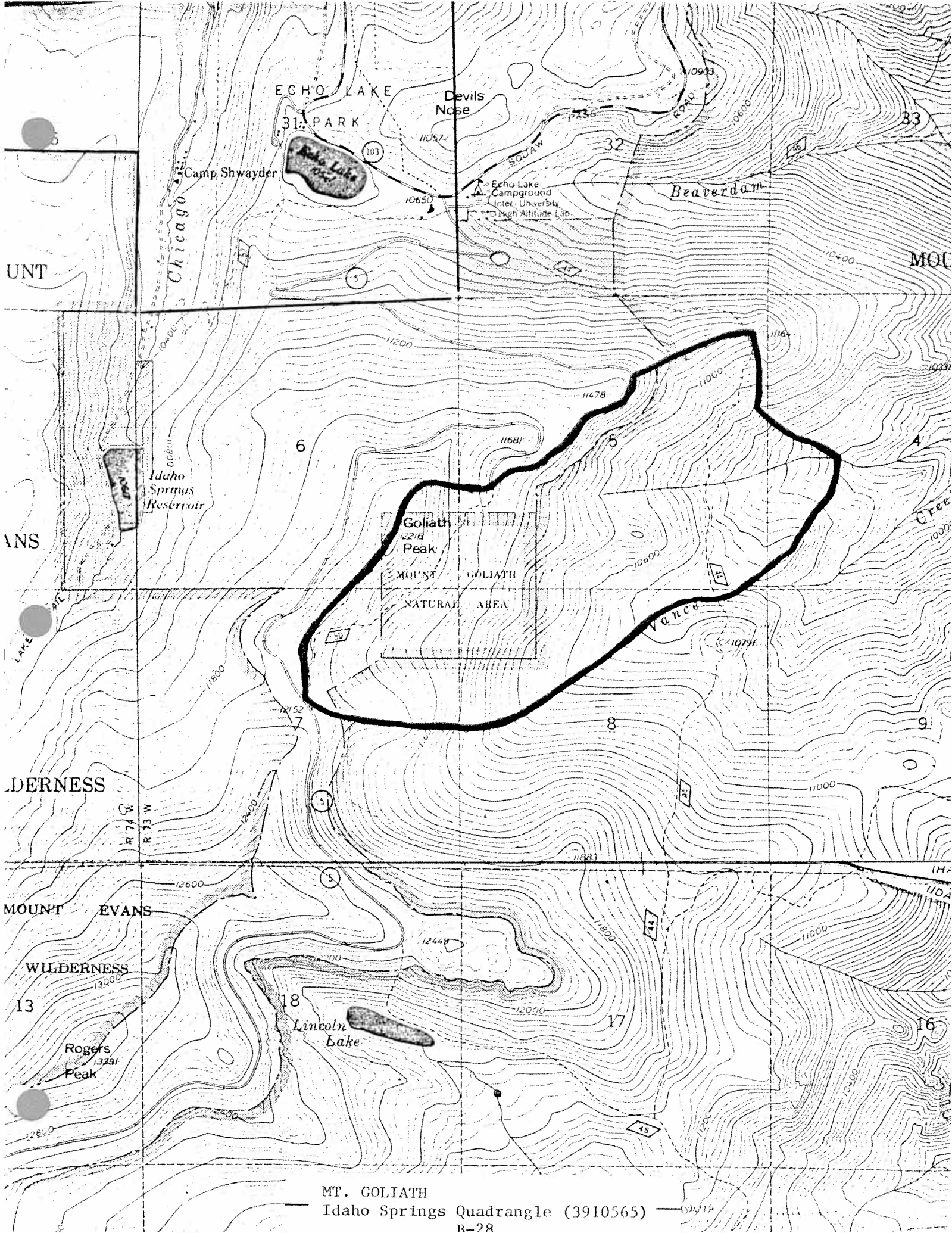
PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT

maintain the integrity of the area for perpetuity. The original size of the RNA was 320 acres. We propose new conservation planning boundaries that better reflect ecosystem protection. The conservation planning boundaries include nearly all of the area's Bristlecone pine, most importantly, the areas of regeneration. Excluded from the boundary are areas above the Mt. Evans road and those areas that are most heavily used by visitors. These areas may serve as useful interpretive areas.

PROTECTION AND MANAGEMENT CONSIDERATIONS: The integrity of the Mt. Goliath RNA has been damaged through unregulated use. The most severe evidence is in the accessible periphery. The most significant protection will come from increased people management. We recommend that the RNA status be maintained. However, the boundaries of the area should be reestablished to reflect the ecological needs of the site. Such a recommendation was made to include more of the actual bristlecone ecosystem in October, 1952 (U. S. Forest Service Memorandum, cited in a Memorandum to Forest Supervisor, Inyo National Forest from W. L. Lloyd, Arapaho National Forest Supervisor, Mar. 9, 1967).

We also recommend that the parking area be upgraded and designed to greatly restrict the numbers of visitors that may use the area. If visitors are encouraged to use the area, then well-marked interpretive trails should be developed. Recognizing the importance of public participation, we recommend that a short trail be developed to pass through the bristlecone pine stands along the Mt. Evans road, but outside of the RNA. Such a trail would enable the user to experience the general characteristics of the pine trees and stands while directing them away from the established RNA. Interpretation should provide adequate information on the fragility of the area and its special status. We also recommend that consideration be given to moving the information booth/station to a less sensitive area.

This area is not within the proposed Continental Divide Trail corridor.



MT. GOLIATH
Idaho Springs Quadrangle (3910565)

PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT
ONE-O-THREE CROSS FIVE

SIZE: ca. 90 acres

BIODIVERSITY RANK: B3

LOCATION: Clear Creek County
Idaho Springs Quadrangle (3910565)

GENERAL DESCRIPTION: The One-O-Three Cross Five conservation site is on the saddle just south of Devils Nose at the junction of routes 103 and 5. The site is heavily impacted by roads, a store and information center, a campground, and recreational users entering the Mt. Evans corridor. The site is just east of Echo Lake in an area which would be largely forested. Dominant trees include Lodgepole pine, subalpine fir, and Engelmann spruce. Extensive searching in the area prior to this study indicated the presence of several species of rare ferns. These diminutive species have been found very near the roads and other areas of heavy activity.

NATURAL HERITAGE RESOURCE SIGNIFICANCE: This site is recognized for the presence of several rare ferns of the genus Botrichia. The ferns are small and likely to be overlooked. We did not specifically search the site for rare plants, rather we depended on the prior work of Peter Root and others.

Element	Common Name	Occurrence Rank	Global Rank	State Rank	Federal Status	State Status
<u>Botrichium echo</u>	Reflected moonwort	C	G2	S?	-	3
<u>Botrichium hesperium</u>	Western moonwort	C	G3?	S?	-	3
<u>Botrichium minganense</u>	Mingan moonwort	C	G4	S?	-	3

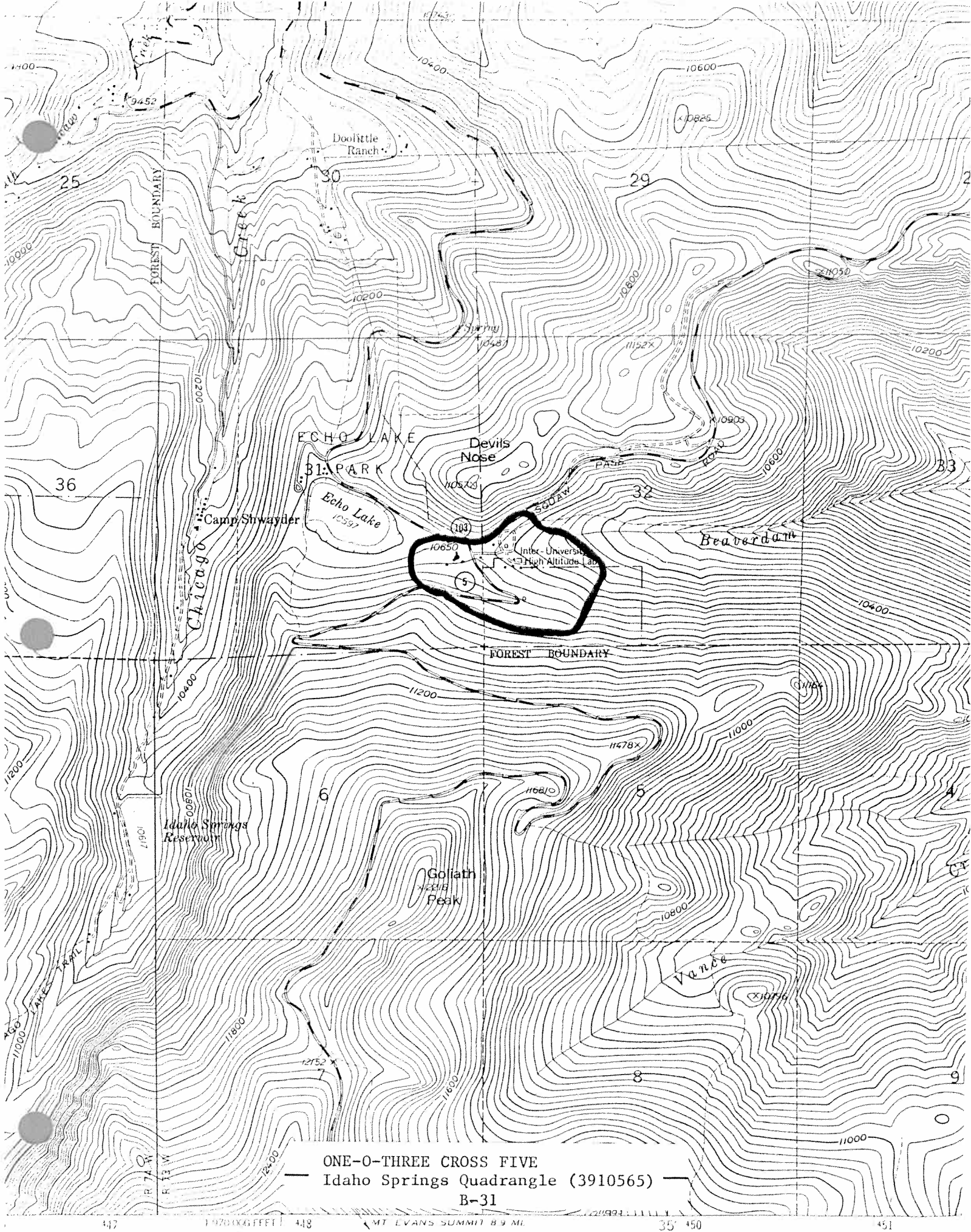
CURRENT STATUS: The preliminary conservation planning boundary includes properties under U. S. Forest Service and private ownerships. At this time none of the property receives special protection.

BOUNDARY JUSTIFICATION: The preliminary conservation planning boundary includes all of the rare species known to occur at the site and an buffer sufficient to protect the occurrences from impacts other than those that currently exist.

PROTECTION AND MANAGEMENT CONSIDERATIONS: No special designation is recommended for this site because of the complex management of the area. Nonetheless, these rare species should be considered in the development of activities within the recommended boundaries.

PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT

In addition, the cryptic nature of these species makes it necessary that inventory be undertaken to protect unknown individuals within the area. These populations/individuals should be given special consideration with the development of the Mt. Evans corridor. Special designation, such as natural area registry, should be sought for the privately owned portions of the site. In addition, these properties should be considered for acquisition from willing landowners by the Forest Service.



ONE-O-THREE CROSS FIVE
— Idaho Springs Quadrangle (3910565) —
B-31

PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT

STANLEY MOUNTAIN

SIZE: ca. 500 acres

BIODIVERSITY RANK: B3

LOCATION: Grand County
Berthoud Pass Quadrangle (3910577)

GENERAL DESCRIPTION: The Stanley Mountain alpine site is a broad, northwest-facing tundra ridge. The area is generally rolling and slumping topography parallel to the dominant slope of the ridge. The elevation ranges from 12,000'-12,400', but slightly higher near Stanley Mountain and other knobs. The vegetation is a well-developed mosaic of plant associations. The area is certainly windswept and largely clear of snow during the winter. Elk sign was abundant. The abundant slumping areas were often wet, with typical vegetation. Four significant plant associations were identified at this site.

NATURAL HERITAGE RESOURCE SIGNIFICANCE: Alpine habitats are not rare in Colorado; however, excellent examples of natural communities and plant associations in ecological regions are considered significant. Stanley Mountain presents a large, high quality area of unfragmented occurrences.

Element	Common Name	Occurrence Rank	Global Rank	State Rank	Federal Status	State Status
<u>Kobresia myosuroides/</u> <u>Geum rossii</u> plant association		A	G5	S5	-	-
<u>Paronychia pulvinata/</u> <u>Silene acaulis</u>		A	G5	S5	-	-
<u>Carex rupestris/</u> <u>Geum rossii</u>		A	G4	S4	-	-
<u>Deschampsia cespitosa/</u> <u>Geum rossii</u>		A	G5	S5	-	-

CURRENT STATUS: The entire area is under U. S. Forest Service ownership. No special status is given the area. Light hiking and perhaps cross-country skiing occur on the site with few visible impacts. The hiking trail is faint, but evident. Trail development, especially if it provides access to bicycles or off-road vehicles, could seriously threaten the integrity of the natural community.

BOUNDARY JUSTIFICATION: The conservation planning boundary incorporates all of the explored area which revealed high

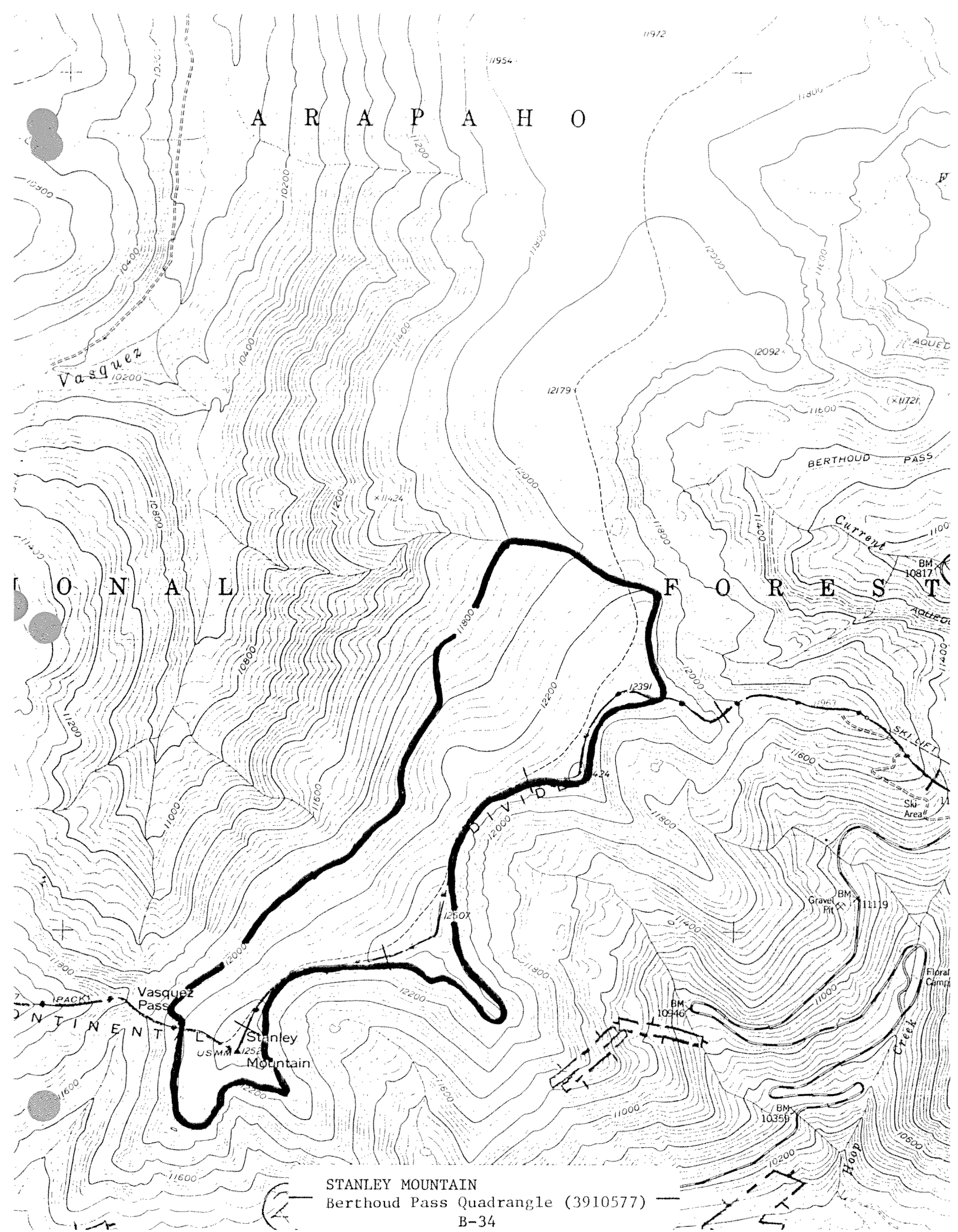
PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT

ecological integrity. Steep slopes to the east and south, and increasing slope to the north and west, provide adequate guidance for boundaries. Further investigation is needed to determine the full extent of the area to the north as far as the Twin Cones.

PROTECTION AND MANAGEMENT CONSIDERATIONS: Uncontrolled access to this significant area would likely seriously impact the conservation site. Existing levels of backcountry use have not threatened the integrity of the area. The development of the proposed Continental Divide Trail would significantly increase visitor use and can be predicted to have detrimental effects, particularly with the ready access from Berthoud Pass. Use by pack animals could also degrade the area. Due to the extent of the significant natural communities, we suspect only a low threat to their existence; however, we note that their integrity could be seriously degraded by a heavy volume of hikers, campers, pack animals, and any off-road vehicle use.

While information on the area north of section 8 is not currently available, aerial photograph study suggests that it is similar to that found on the Stanley Mountain site. We recommend that the area north to Twin Cones be protected from further development at least until such time as a sensitive species and natural community survey can be conducted.

We also recommend that the Stanley Mountain site be considered for designation as a Special Interest Area. The existing preliminary conservation planning boundaries will provide a core area with the possibility that additional survey may suggest the need to expand boundaries northward along the ridge.



PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT

SUMMIT LAKE

SIZE: ca. 1,500 acres

BIODIVERSITY RANK: B3

LOCATION: Clear Creek County

Mt. Evans Quadrangle (3910556)

Harris Park Quadrangle (3910555)

GENERAL DESCRIPTION: The Summit Lake conservation site is dominated by a large, alpine lake and extending onto the wet tundra of Summit Lake Flats. The lake is within an east-northeast-facing cirque at 12,830'. Well-developed alpine wetlands characterize the inlet and outlet area of the Lake as well as on the Summit Lake Flats. These habitats are characterized by several extremely rare plants in Colorado. Frost-push hummocks with thick moss beds and anastomosing rivulets with gravel bars are locations for several of the rare plants. Alpine wild flower displays are extensive resulting in a diverse and abundant insect community. The Mt. Evans road bisects the area. A parking area above Summit Lake permits direct access from hikers, sightseers, hunters, and fishermen. The parking area is also used by the Department of Transportation for stockpiles and a local operations center.

NATURAL HERITAGE RESOURCE SIGNIFICANCE: Three state-rare plant species are known from the vicinity of Summit Lake. The tundra vegetation of the Summit Lake Flats is a significant example of this natural community. This combination of rare plants and significant natural communities is not known from any other place in Colorado.

Element	Common Name	Occurrence Rank	Global Rank	State Rank	Federal Status	State Status
<u>Koenigia islandica</u>		A	G?	S1	-	2
<u>Phippsia algida</u>	Snow grass	A	G4	S1	-	3
<u>Saxifraga foliolosa</u>	Leafy saxifrage	A	G4	S1	-	3
<u>Carex scopulorum</u> wetlands	alpine wetlands	A	G3G4	S3S4	-	-

CURRENT STATUS: The Summit Lake area is in complex ownership and management. The lake and immediate surrounding area is owned and managed by Denver Mountain Parks. The surrounding area is under ownership of the Forest Service, much of which is within the Mt. Evans Wilderness Area. The Mt. Evans road is a state-maintained highway with an associated right-of-way. Also of significance, the

PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT

Summit Lake area was dedicated as a National Natural Landmark by the National Park Service.

The area is intensively used by the public. Most of the users drive the road to Summit Lake and the peak of Mt. Evans. The Summit Lake parking area is intensively used. Signs of severe habitat degradation are common in the Lake area and are extending into the more remote portions of the conservation site.

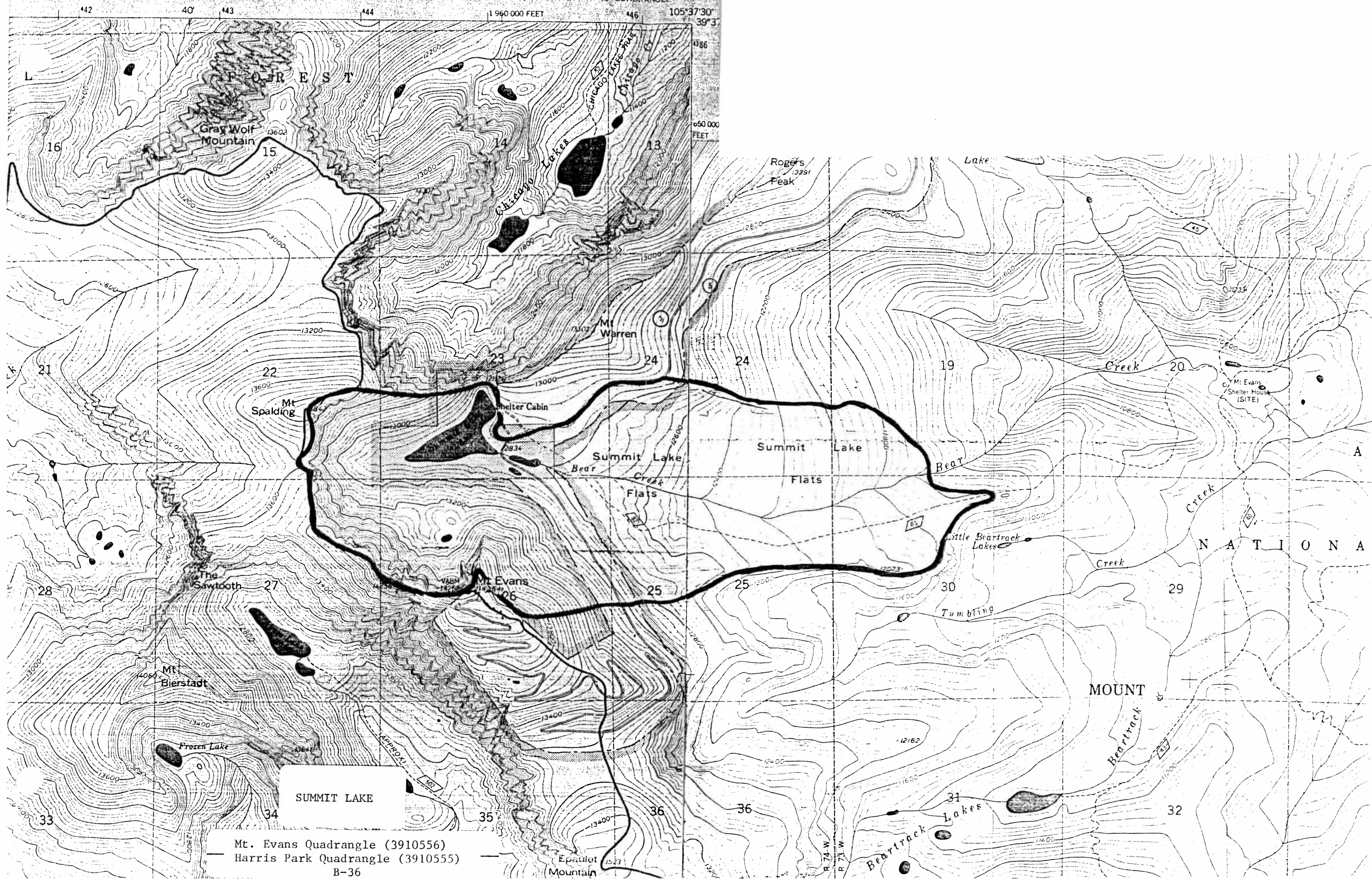
BOUNDARY JUSTIFICATION: The preliminary conservation planning boundaries include all of the known occurrences of rare plant species and significant natural communities. A buffer is provided to acknowledge ecological processes and to provide guidance for management activities.

PROTECTION AND MANAGEMENT CONSIDERATIONS: The Summit Lake area is unique in Colorado for its natural features, including its geomorphology as well as its proximity to the metro-Denver area. All rare species known to occur at this conservation site are extant. However, the environs of the Lake are heavily stressed from overuse. Foot traffic around the parking area and lake have caused extensive trampling. Recreational and education foot traffic not completely ring the lake, threatening the highly significant inlet to Summit Lake. Threats exist from highway maintenance activities and include stockpiling raw materials, alterations of natural hydrology, and potential chemical runoff from salting and paving.

We recommend the following stewardship actions: (1) develop a well-maintained parking area which allows for good traffic flow while restricting the numbers of vehicles. Development should be directed uphill, away from the Lake's edge; (2) trails should be well-marked and supervised. Cross-country walking should be discouraged, but prevented in the vicinity of especially sensitive areas (e.g. the lake inlet area); (3) Highway maintenance activities should avoid the conservation site to the maximum extent possible; (4) Stocking of fish in Summit Lake and the subsequent recreational use should be evaluated via a risk analysis.

The ecological significance of the area should be protected. We recommend that the Forest Service consider this site as a candidate for Special Interest Area or Special Management Area designation. Such a designation would be complex given the ownership patterns but would reflect the landscape approach to management as called for under the guidelines for Ecosystem Management.

The Summit Lake area is not within any of the proposed Continental Divide Trail corridors.



Mt. Evans Quadrangle (3910556)
Harris Park Quadrangle (3910555)
B-36

PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT
UPPER CLEAR CREEK

SIZE: ca. 75 acres

BIODIVERSITY RANK: B4

LOCATION: Clear Creek County
Loveland Pass Quadrangle (3910568)
Grays Peak Quadrangle (3910567)

GENERAL DESCRIPTION: The Upper Clear Creek site is a stream valley, bounded on the north by Interstate 70. The south is the steep slope of Mt. Sniktau. Much of the stream valley is along the base of the densely forested slope. The forest is mid-aged and sized post-fire stands. Patches of older stands occur in the more mesic areas. The entire base of the slope is mesic to wet with a mossy understory. Many streams, rivulets, seeps and springs enter the stream valley from the mesic north-facing slope. Several small areas are very wet and therefore dominated by willows and deep moss and carices. Birch is scattered throughout the wetter areas. At the mouth of Herman Gulch significant plant associations and a single rare plant species occur.

NATURAL HERITAGE RESOURCE SIGNIFICANCE: The wetlands occurring on at this site are significant seeps. The wetlands occurring at the site remain abundant, but many of the previously known occurrences are highly degraded. The occurrence of Carex leptalea is extremely rare of Colorado and is in a highly protectable site.

Element	Common Name	Occurrence Rank	Global Rank	State Rank	Federal Status	State Status
<u>Carex rostrata</u> wetlands		B	G3G4	S3	-	-
<u>Carex leptalea</u>	Bristle-stalk sedge	AB	G4	S1	-	3

CURRENT STATUS: The Upper Clear Creek site is not given special status. The corridor is potentially threatened by development of a bike path from Bakersville to Loveland Pass. High recreational use already occurs and is being developed further.

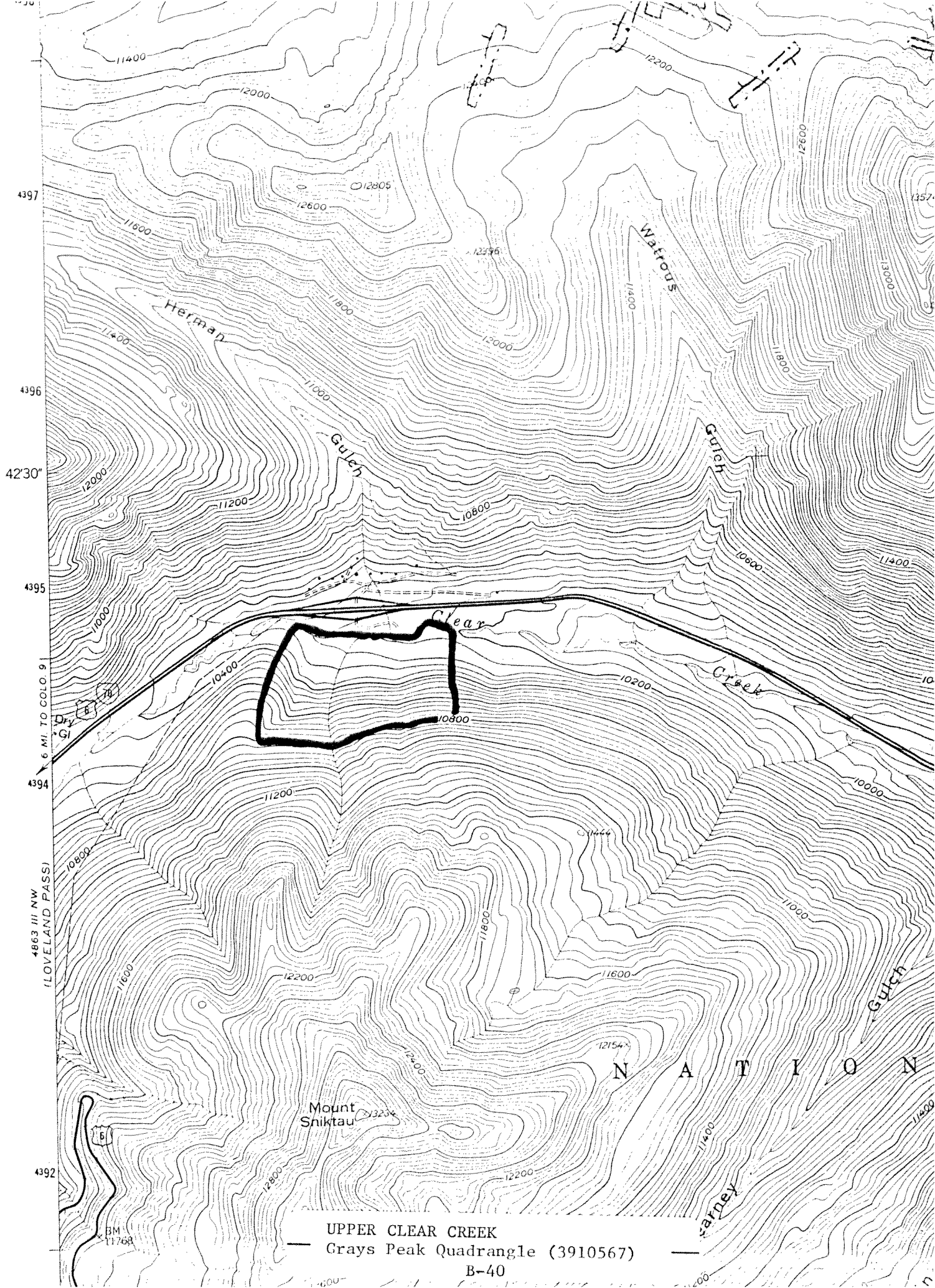
BOUNDARY JUSTIFICATION: The conservation planning boundaries include all known occurrences of natural heritage resources. Buffers are also included, primarily to protect ecological processes that maintain the wetland environment.

PROTECTION AND MANAGEMENT CONSIDERATIONS: The site is threatened by increasing recreation use and trail development. It is

PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT

essential that the trail avoid this site. The wetland depends on an intact hydrology, believed to extend from the floodplain of the creek, uphill onto the slopes of Mt. Sniktau. We recommend this site for consideration for special designation as a Special Interest Area. Should the bike/hiking trail be developed across the creek from the site, an excellent opportunity would be created for interpretation of montane wetland ecology while protecting this significant site.

The combined threats of the bike/hiking trail and the proposed Continental Divide Trail corridor are believed to be moderate to all elements of natural diversity. Should the trail be developed through the existing significant features or within the conservation planning boundaries, these threats would be elevated to high. It is clear that trail design and user guidance will be essential to the long term protection of these sensitive features.



UPPER CLEAR CREEK

Grays Peak Quadrangle (3910567)

B-40

PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT
WEST VASQUEZ PASS

SIZE: ca. 135 acres

BIODIVERSITY RANK: B4

LOCATION: Clear Creek and Grand counties
 Berthoud Pass Quadrangle (3910577)

GENERAL DESCRIPTION: The West Vasquez Pass site occurs on the south side of a small pass on an east to west trending ridge. The area includes rock outcrops, Deschampsia cespitosa meadows, depressions with Salix glauca and S. planifolia, several seepy/snowmelt areas with thick moss, wetland stands of Eleocharis and other small wetland features. The portion of the site just below treeline is forested with subalpine fir with a lush herbaceous layer. Many seeps and springs arise from the forest floor.

NATURAL HERITAGE RESOURCE SIGNIFICANCE: The rock outcrops on this pass contain the endemic and dwarf columbine, Aquilegia saximontana. The forested portion of the basin, just below treeline provides habitat for the boreal toad, Bufo boreas. Should this toad be found to be reproducing in this basin, the significance would be greatly increased.

Element	Common Name	Occurrence Rank	Global Rank	State Rank	Federal Status	State Status
<u>Bufo boreas</u>	Boreal toad	C	G4	S2	C2	SC
<u>Aquilegia saximontana</u>	Rocky Mountain columbine	B	G2G3	S2S3	3C	4

We note that fragments of flint were found at the base of several rocks in what may have been a site of pre-European use. We recommend that the site be studied to determine any significance prior to any trail development since the area used by indigenous peoples are usually excellent camping or activity sites for modern visitors.

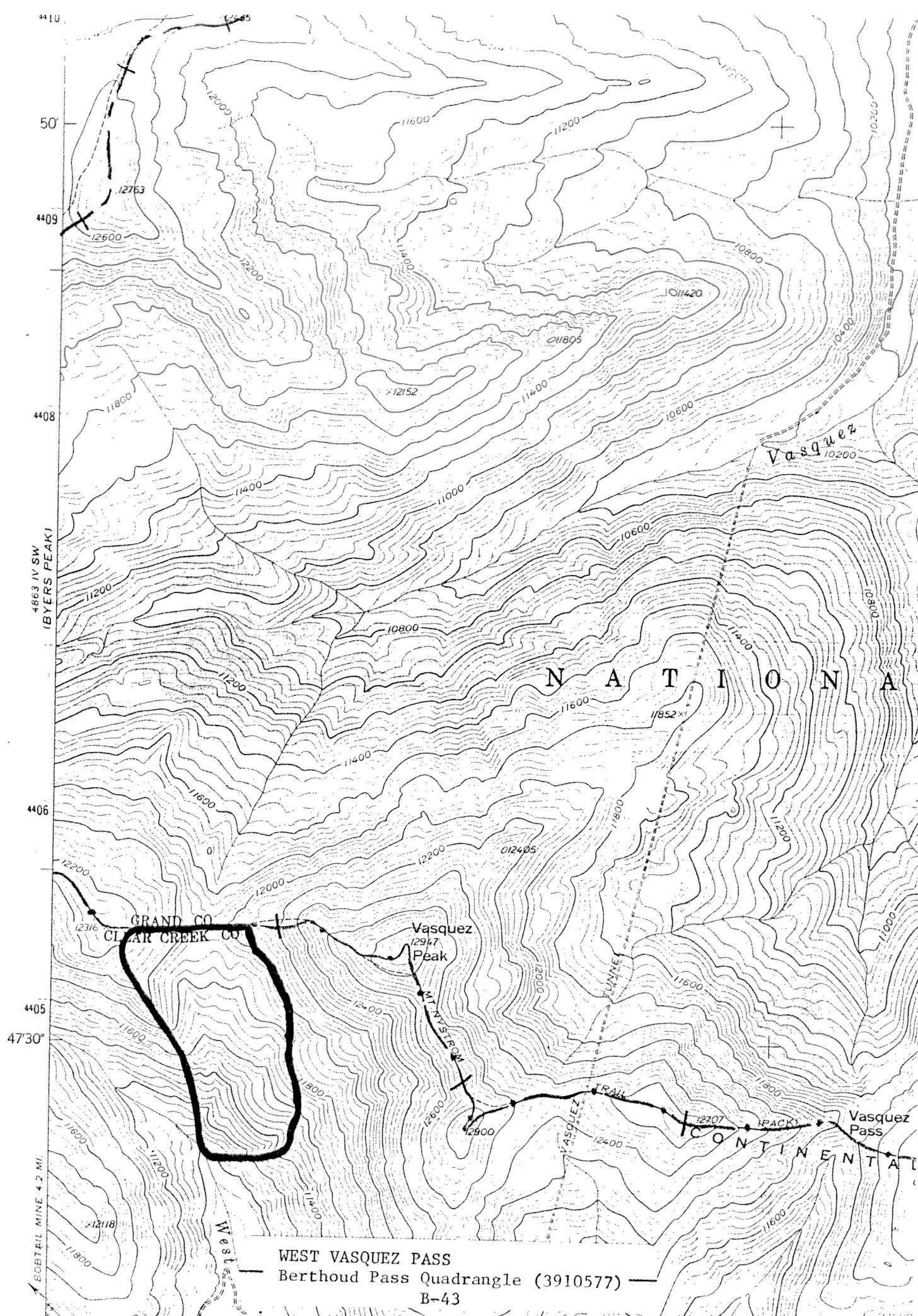
CURRENT STATUS: The site is owned entirely by the U. S. Forest Service. No special status is given. A moderate threat exists to this site if users of the proposed Continental Divide Trail use the treeline area for camping. Little evidence of recent human impact was evident. If grazing and logging occurred in the past, there has been considerable recovery. The ready access by jeep trail poses some threats. The Aquilegia population is not threatened by projected activities due to its relatively inaccessible habitat.

PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT

BOUNDARY JUSTIFICATION: The boundary for this site includes both of the known rare species. The columbine was only found on one rock outcrop, but the search occurred late in the season. Of significance is the inclusion of features of hydrological importance. The boreal toad undoubtedly depends on the intact hydrological processes.

PROTECTION AND MANAGEMENT CONSIDERATIONS: The locations of these rare species should be used to guide activities in the area. We project that camping pressures will increase if the trail on the ridge above the site is developed. We do not recommend special status designation until additional data are gathered. Should the Boreal toad found represent a successfully breeding population, more intensive management and a possible special designation for the site would be warranted. Due to the reported rates of decline for the Boreal toad, we recommend that survey work be conducted in the 1993 field season to ascertain the true status of the population.

The proposed Continental Divide Trail corridor poses low to moderate threats to these elements unless camping and trail use from below increases significantly. The Aquilegia saximontana occurs in inaccessible rocky ledges and is not considered threatened. The Bufo boreas may breed in a small pond at the headwaters of Vasquez Creek. However, the level of threats from possible recreational increases can only be evaluated after more detailed data are collected from the site.



PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT

WITTER PEAK

SIZE: ca. 67 acres

BIODIVERSITY RANK: B3

LOCATION: Clear Creek County
Empire Quadrangle (3910576)

GENERAL DESCRIPTION: The Witter Peak site is on an east to west trending ridge and all above 12,700'. The terrain is nearly flat to gently rolling and on granite substrate and is apparently heavily windswept. Vegetation is predominantly cushion plant communities. Much of the area is rocky fellfield with some cliffs and bedrock outcrops on the south face. There are few apparent human impacts.

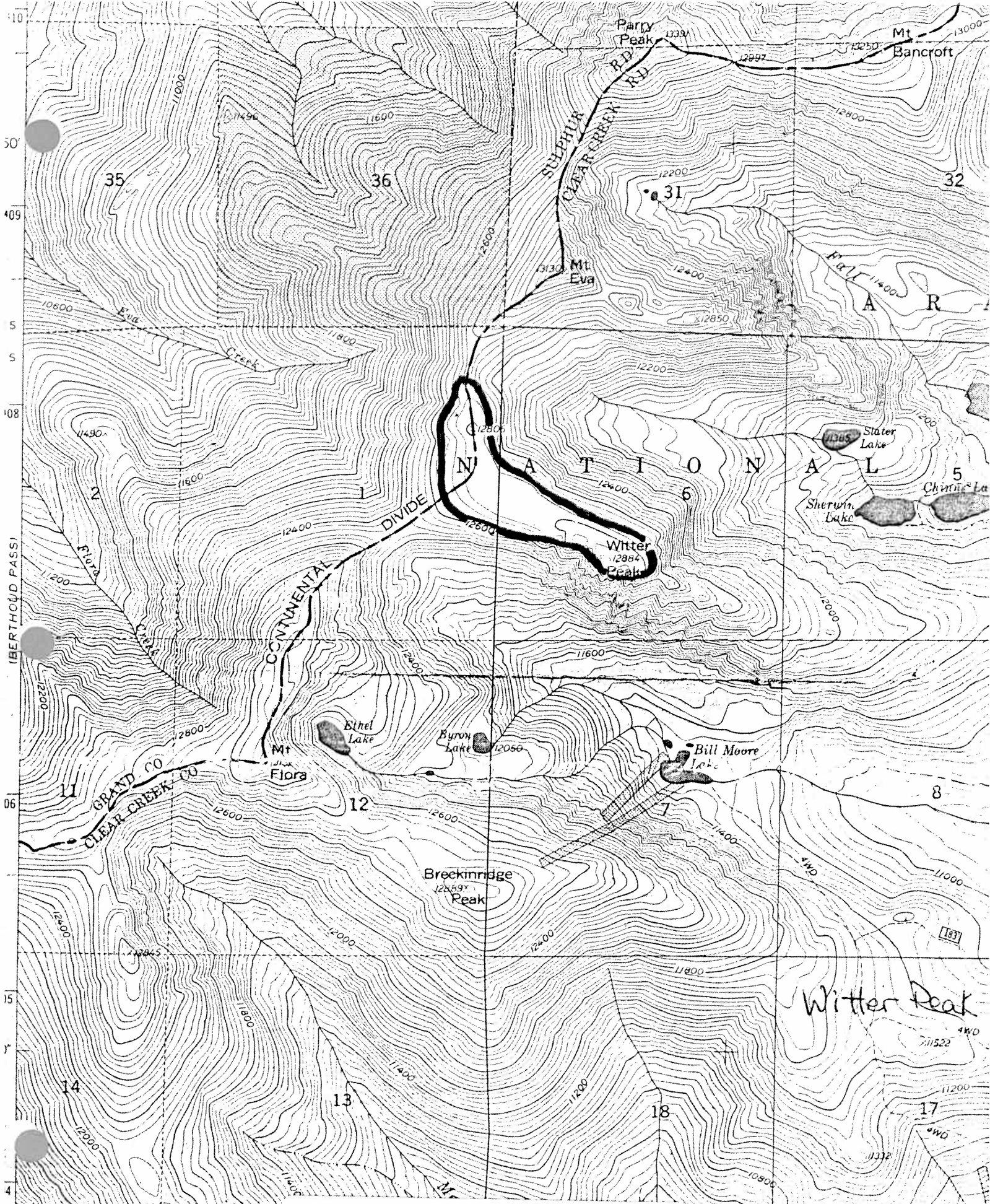
NATURAL HERITAGE RESOURCE SIGNIFICANCE: This unusually high, flat site is covered by an excellent example of a fellfield plant association. This association is common in Colorado, but generally more fragmented. This large example is of ecological significance.

Element	Common Name	Occurrence Rank	Global Rank	State Rank	Federal Status	State Status
<u>Paronychia pulvinata</u> - <u>Silene acaulis</u> fellfield plant association	alpine fellfield	A	G5	S5	-	-

CURRENT STATUS: This site is currently not given special status. The remote nature of the site has provided some protection to date. The area is within a proposed corridor of the Continental Divide Trail. Increased access to this flat site may threaten the ecological integrity since this is an ideal camping area.

BOUNDARY JUSTIFICATION: The preliminary conservation planning boundary includes the entire element occurrence. Since this is a peak, there is little justification for a buffer.

PROTECTION AND MANAGEMENT CONSIDERATIONS: The physical nature of this site suggests that should increased human access occur, the site will experience degradation. We recommend that special status be considered for the site and that an alternate route for trails be chosen. Monitoring the vegetation should be implemented. Camping or pack animal grazing should be prohibited at this site.



WITTER PEAK
— Empire Quadrangle (3910576)
B-45

PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT

BARD CREEK

SIZE: ca. 290 acres

BIODIVERSITY RANK: B4

LOCATION: Clear Creek County
Grays Peak Quadrangle (3910567)

GENERAL DESCRIPTION: The Bard Creek drainage is a generally unfragmented area with high quality water quality, inhabited by the Greenback cutthroat trout (Oncorhynchus clarki stomias). An undeveloped hiking trail parallels the stream course for a short distance. The area is forested except for the upper reaches of the stream (at or above treeline). Forest composition is typical, Picea engelmanni and Abies lasiocarpa.

NATURAL HERITAGE RESOURCE SIGNIFICANCE: This subspecies of the Cutthroat trout is listed as endangered. It is a globally rare subspecies, restricted to the eastern slopes of the Southern Rocky Mountains. The subspecies is being heavily managed and populations are protected. Restocking of historically inhabited streams was used to replenish stocks. The genetic integrity of the subspecies is continuously threatened by exotic relatives. Bard Creek is a high quality occurrence of this subspecies.

Element	Common Name	Occurrence Rank	Global Rank	State Rank	Federal Status	State Status
<u>Oncorhynchus clarki stomias</u>	Greenback cutthroat	C	G5T3	S2	LT	LT

CURRENT STATUS: This site is currently not given special status, although it is protected from undue fishing. The remote nature of the site has provided some protection to date. The area is within a proposed corridor of the Continental Divide Trail. Increased access to this flat site may increase fishing pressures, continuing to threaten the population of trout.

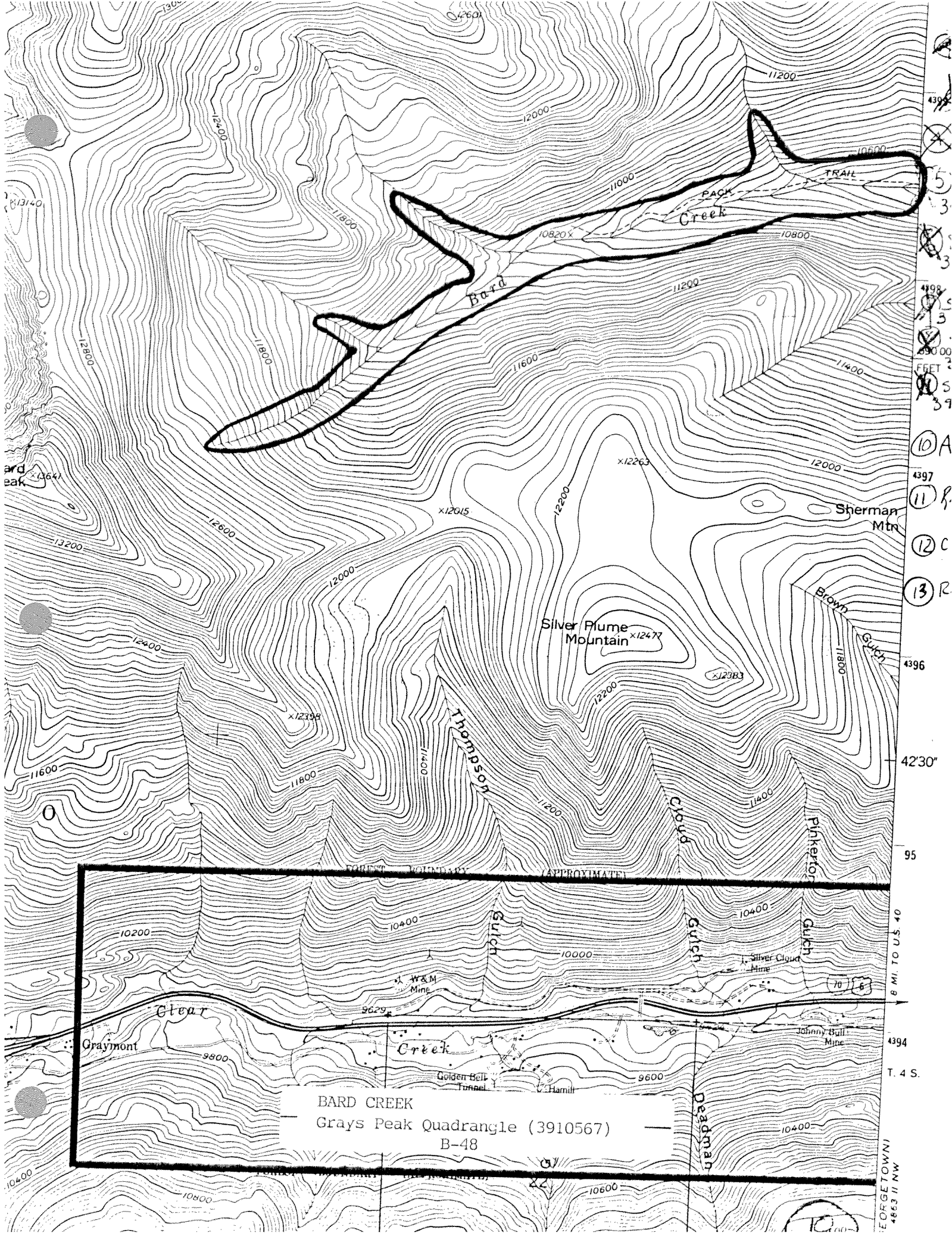
BOUNDARY JUSTIFICATION: The preliminary conservation planning boundary includes the entire element occurrence. A small buffer has been incorporated to provide protection from any significant impacts (e.g. heavy camping, pack animal, and trail development). We have approximated 1,000' as a buffer.

PROTECTION AND MANAGEMENT CONSIDERATIONS: The remote nature of this stream has provided some protection to date. However a trail penetrates the Conservation Site from the east. An assessment of the viability of this population should be conducted. Management

PROPOSED CONTINENTAL DIVIDE TRAIL CORRIDOR--CLEAR CREEK DISTRICT

efforts should strive for self-sustainability in the population. The area should also be considered for designation as a Special Interest Area-Zoological Emphasis. Fishing pressure should be monitored.

The creek is proposed as an Alternative corridor for the Continental Divide National Scenic Trail. Potential impacts from such development could include siltation, water quality degradation, increased fishing pressure, and degradation of the riparian vegetation. Most of these threats may be of moderate significance with light use of a trail; however, the accessibility of the area and the proximity to the Denver Metropolitan area suggest that caution should be taken. Should the trail be developed in this basin we would encourage the tread be constructed considerably upslope from the creek. In addition, careful monitoring of human use of the area should be conducted.



BARD CREEK
Grays Peak Quadrangle (3910567)
B-48

10 A
11 B
12 C
13 R

95

8 MI. TO U.S. 40

4394

T. 4 S.

4663 II NW

APPENDIX C

Natural Heritage Rank Explanation Sheet

Definition of Abbreviations Used on Natural Heritage Resource Lists
of the
Colorado Natural Heritage Program

Natural Heritage Ranks

The following ranks are used by the Colorado Natural Heritage Program to set protection priorities for natural heritage resources. Natural Heritage Resources, or "NHR's," are rare, threatened or endangered plant and animal species, rare and exemplary natural communities, and significant geologic features. The primary criterion for ranking NHR's is the number of populations or occurrences, i.e. the number of known distinct localities. Also of great importance is the number of individuals in existence at each locality or, if a highly mobile organism (e.g., large mammals, many birds, and butterflies), the total number of individuals. Other considerations may include the quality of the occurrences, the number of protected occurrences, and threats. However, the emphasis remains on the number of populations or occurrences such that ranks will be an index of known biological rarity.

- S1 Extremely rare; usually 5 or fewer populations or occurrences in the state; or may be a few remaining individuals; often especially vulnerable to extirpation.
- S2 Very rare; usually between 5 and 20 populations or occurrences; or with many individuals in fewer occurrences; often susceptible to becoming extirpated.
- S3 Rare to uncommon; usually between 20 and 100 populations or occurrences; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances.
- S4 Common; usually >100 populations or occurrences, but may be fewer with many large populations; may be restricted to only a portion of the state; usually not susceptible to immediate threats.
- S5 Very common; demonstrably secure under present conditions.
- SA Accidental in the state.
- S#B Breeding status of an organism within the state.
- SH Historically known from the state, but not verified for an extended period, usually > 15 years; this rank is used primarily when inventory has been attempted recently.
- S#N Non-breeding status within the state. Usually applied to winter resident species.
- SU Status uncertain, often because of low search effort or cryptic nature of the element.
- SX Apparently extirpated from the state.
- SZ Long distance migrant whose occurrences are too irregular, transitory and/or dispersed to be reliably identified, mapped and protected.

Global ranks are similar, but refer to a species' rarity throughout its total range. Global ranks are denoted with a "G" followed by a character. Note that GA and GN are not used and GX means apparently extinct. A "Q" in a rank indicates that a taxonomic question concerning that species exists. Ranks for subspecies are denoted with a "T". The global and state ranks combined (e.g. G2/S1) give an instant grasp of a species' known rarity.

These ranks should not be interpreted as legal designations.

Federal Legal Status

The Colorado Natural Heritage Program uses the standard abbreviations for Federal endangerment developed by the U.S. Fish and Wildlife Service, Division of Endangered Species and Habitat Conservation.

- | | |
|--------------------------------------|---|
| LE - Listed Endangered | C2*- Under review for listing; possibly extinct |
| LT - Listed Threatened | 3A - Former candidate - presumed extinct |
| PE - Proposed Endangered | 3B - Former candidate - not a valid species under current taxonomic understanding |
| PT - Proposed Threatened | 3C - Former candidate - common or well protected |
| C1 - Candidate for formal listing | NF - No federal status |
| C2 - Under review for formal listing | |

State Legal Status

The Colorado Natural Heritage Program uses similar abbreviations for State endangerment.

- | | |
|-----------------------|----------------------|
| E - Listed Endangered | U - Unknown |
| T - Listed Threatened | NS - no state status |
| SC - Special Concern | |

Plant species of Special Concern as designated by the CO Natural Areas Program are indicated with 1,1*,2*,2,3,4

For information on the laws pertaining to threatened or endangered species, contact:

U.S. Fish and Wildlife Service for all FEDERALLY listed species
Department of Natural Resources - Division of Wildlife for all STATE wildlife (vertebrates)

APPENDIX D

Primary Natural Heritage Data Forms used in
Gathering Site and Element Information

COLORADO NATURAL HERITAGE PROGRAM
ELEMENT OCCURRENCE RECORD:

NEW? ☐ UPD? ☐ (ID:)
(JF7)

SCIENTIFIC NAME: (ECNUM):

(SITENAME): SURVEYSITE:

(PRECISION) COUNTY (code): / /

QUADNAME(S): (QUADCODE): / /

(MARGNUM): / / (DOTNUM): / / (TENTEN): / /

(LAT): (S): (N):

(LONG): (E): (W):

TOWNRANGE: SECTION: (MERIDIAN):

TRSCCM:

DIRECTIONS:

(PHYSPROV): (WATERSHED):

SURVEYDATE: (LASTOBS): (FIRSTOBS):

ECRANK: ECRANKDATE: (year)

ECRANKCOM:

ECDATA:
(pop'n. size and structure, extent, reproduction, disease, predation / community condition, size, dominance, special features)

GENDESC:
(habitat, landform, land use, associated species, etc.)

MANAME: (CNTND1):

MANAME: (CNTND2):

MANAME: (CNTND3):

MGMTCOM:
(threats e.g. oversnading, overcollecting AND mgmt resolutions e.g. fire, fencing, etc)

PROTCOM:
(threats e.g. development, etc AND protection resolutions e.g. acquisition, easement, special designation)

OWNER:

OWNERCOM:

COMMENTS:

DATASENS: BOUNDARIES: PHOTOS:

BESTSOURCE:

SOURCECODES: COUS / COUS / COUS / COUS

COUS / COUS / COUS / COUS

TRANSCRIBER: (MAPPER): (QC1):

COEOR.FRM 4/92

SUPPLEMENTAL FIELD DATA: RARE SPECIES OCCURRENCE

WEATHER: _____
 SLOPE: _____ ASPECT: _____ ELEV.: _____ TOPO. POS.: _____
 LIGHT: _____ MOISTURE: _____ GEOLOGY: _____
 SOIL: _____

HABITAT COMMENTS: _____

COMMUNITY COMMENTS: _____

DISTURBANCE: _____

THREATS: _____

POPULATION DOCUMENTED VIA: Specimen _____ Sight _____ Tracks/sign _____ Songs/calls _____ Roadkill _____ Photo _____ Verbal _____

ID PROBLEMS? (yes/no): _____ ID COMMENTS: _____

SPECIMEN NUMBER: _____ REPOSITORY: _____

NUMBERS OBSERVED: _____ POPULATION SIZE ESTIMATE: _____
 (give age and sex if known)

ESTIMATED AMOUNT OF POTENTIAL HABITAT (acres): _____ PERCENT OF POTENTIAL HABITAT OCCUPIED: _____

POPULATION SIZE AND HABITAT AREA COMMENTS: _____

REPRODUCTION: _____

DISEASE OR PREDATION: _____

PHENOLOGICAL CONDITION: _____

BEHAVIORAL NOTES: _____

EO RANKING CONSIDERATIONS:

RANK	COMMENT
_____	_____

QUALITY: A B C D _____
 (pop'n. size, productivity, vigor of individuals, etc.)

CONDITION: A B C D _____
 (habitat pristine, recoverable, degraded, etc.)

VIABILITY: A B C D _____
 (likelihood of long-term survival, based on intrinsic biological factors)

DEFENSIBILITY: A B C D _____
 (likelihood of long-term survival, based on intrinsic and extrinsic site factors)

NEW: _____ EXISTING: _____ UNDECIDED: _____

--

<u>Date</u>			<u>Time</u>	<u>Surveyor(s)</u>	<u>Source Code</u>
(year)	(mo)	(day)			
1. 9.	.	.	to		F
1. 9.	.	.	to		F
1. 9.	.	.	to		F
1. 9.	.	.	to		F
1. 9.	.	.	to		F

COUNTY/CITY: _____ QUADNAME: _____ QUADCODE: _____
(CO)

PRECISE LOCATION (distance and direction from a prominent feature shown on the topographic map, or some other map):

ROAD DIRECTIONS TO SITE:

LOCATION OF SITE ACCESS POINT (where to park, location of important trail):

Under "Element Name" list all elements sought, reported, or confirmed from the site. If known, record the Occurrence Numbers (EONUM) for each. Generate simple letter or number codes which identify the location of each element occurrence on the base map; these codes help keep the base map uncluttered. Indicate whether the element was found (Y, N, N/A) on the date of the site visit, and whether a return visit is needed.

[illegible]

SITE DESCRIPTION:

Page 2.

SITE MAP?: _____ MAPDATE: 1. 9. _____ DESIGNER: _____

TOPOGRAPHIC BASE MAP:

Attach a photocopy of the topographic map and/or aerial photograph showing the site. Complete steps 1 and 2 below.

Completed?

- ____yes ____no 1. Indicate precise element locations and/or boundaries (use solid lines). Identify each element with the codes you used on page 1.
- ____yes ____no 2. If knowledge of the site permits, draw primary () and secondary () ecological site boundaries. Within the primary site boundary include all known element occurrences and lands necessary for the immediate protection of the EOs. The secondary boundary (or buffer) includes lands intended to mitigate future unforeseen negative impacts to the EOs (e.g. to control erosion, trespass related damage, natural succession, exotic species, urban sprawl). Use () where primary and secondary boundaries coincide. Below, provide a brief written justification of the boundary locations.

Boundary Justification:

APPROX. TOTAL ACRES WITHIN PRIMARY AND SECONDARY BOUNDARIES: _____ ACRES WITHIN PRIMARY BOUNDARY: _____

GENERAL SITE COMMENTS:

BIOODIVERSITY SIGNIFICANCE RANK (B1 B2 B3 B4 B5) AND COMMENT:

PROTECTION URGENCY: (circle one)
P1 immediately threatened
P2 threat expected within 5 yrs.
P3 threatened, but not in next 5 yrs.
P4 no threats imminent
P5 land protection complete

MANAGEMENT URGENCY: (circle one)
M1 management needed this year
M2 management needed within 5 yrs. to prevent loss of EOs
M3 management needed within 5 yrs. to maintain current EO quality
M4 management may be needed in future
M5 no management needed

Protection Urgency Comments (& date):

Management Urgency Comments (& date):

LAND DESIGNATION: Public _____ Private _____ Adjacent Public _____

D5

STEWARDSHIP:

Page 3.

Land Use Comments:

Describe current and past land use, improvements, and structures, and possible stewardship implications.

Potential Hazards Comments:

Describe any potential hazards, both natural (e.g. cliffs, caves, venomous snakes, etc.), and of human origin (e.g. mine shafts, old wells, dangerous structures). Prescribe appropriate precautions.

Exotic Flora/Fauna Comments:

List problem exotic species, describe their effects on the EOs, and, if possible, prescribe control methods.

Off-site Considerations:

Describe off-site land uses (e.g. farming, grazing, mining, urban development, stream perturbations) and how these uses might affect the EOs on the site and their future management.

Information Needs:

Site and Element Management Needs:

Summarize the expected management needs for the site and its EOs.

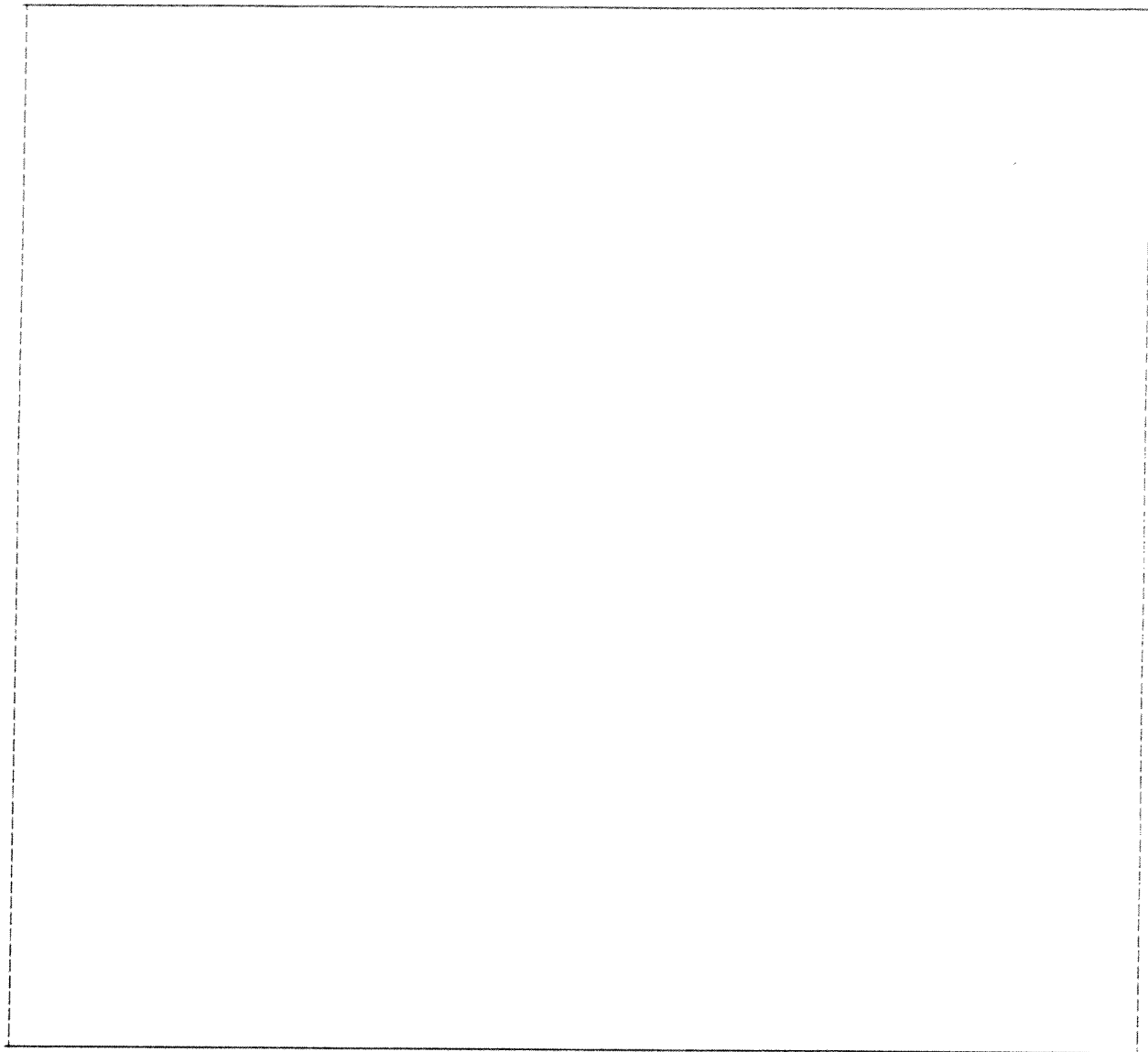
Managed Area Comments:

CZM SITE: (y, n) _____

Tract Ownership or Managed Area Name (names, addresses, phone #):

DETAILED SKETCH MAP:

The purpose of this map is to show fine details of the site which are not shown on the topographic base map. This map can be used to show: (1) EO locations, (2) study plots or marked individuals, (3) natural landmarks, and (4) disturbance features, such as structures and trails. Include scale and indicate north.



Species List

List the dominant (or abundant) species as well as any others that are notable, especially those that are characteristic or distinctive of the community. If possible, sub-divide the list by stratum. Include animal species as appropriate for describing the community.

[illegible]

SITE SURVEY SUMMARY - ADDENDUM (additional notes from a subsequent visit):

SITE NAME: _____

SURVEY SITE: _____

DATE: 1. 9. _____

SURVEYOR: _____

SOURCE CODE: F _____

LOCATION: _____

SITE DESCRIPTION/DESIGN: _____

SITE SIGNIFICANCE: _____

STEWARDSHIP:
Land Use Comments: _____

Potential Hazards: _____

Exotic Flora/Fauna: _____

Off-site Considerations: _____

Site and Element Management Needs: _____

Managed Area Comments: _____

Tract Ownership: _____

MOST SIGNIFICANT OR OBVIOUS CHANGE SINCE LAST VISIT: _____

SURVEYOR _____ MO _____ DAY _____ YR _____
 CODE ON MAP _____ OCC SIZE _____ AC/HA PLOT #S _____
 Comm Id. _____ Eocode _____ * _____ WY
 SURVEY SITE _____ County WY _____
 TRSCOM _____

D I R E C T I O N S _____

Elev _____ ft/m TOPO POS _____ Code _____
 ASPECT _____ 0 PARENT MATERIAL _____ Code _____
 SLOPE _____ 0 /% Valley width _____ ft/m Valley depth _____ ft/m
 SPECIAL FEATURES _____ Code: _____
 SOIL DESCRIPTION _____ Code: _____
 EROSION TYPE _____ Code: _____
 D I S T U R B A N C E S I G N S _____

 Riparian Features for Occurrence

CHANNEL: W I D T H _____ FT/M DEPTH _____ FT/M ENTRENCH _____ FT/M
 BED MATERIAL _____ MULT CHANNELS? _____
 BANK STAB _____ HT ABOVE CHANNEL _____ FT/M
 D I S T F M CHANNEL _____ FT/M R I P A R POS _____
 FLOODPLAIN W I D T H _____ FT/M Stream Type _____

 V E G E T A T I O N D E S C R I P T I O N

CANOPY HT (FT/M) | COVER: FORB _____ | % GRAS _____ | % SEDG _____ | % EVRGRN SHRUB _____ | %
 DECID SHRUB _____ | % EVRGRN TREE _____ | % DECID TREE _____ | % TOTAL _____ %
 GROUND COVER: SOIL (<1/16") _____ GRAVEL (1/16-3") _____ ROCK (>3") _____
 L I T T E R _____ W O O D (<1/4") _____ B A S A L V E G _____ M O S S _____ = 100%

L A N D S C A P E & A D J . C O M M U N I T I E S _____

OCC QUALITY _____ Rank _____
 OCC COND IT I O N _____ Rank _____
 OCC V I A B L T Y _____ Rank _____
 OCC D F N S B L T Y _____ Rank _____

EORank _____ PAGES _____ PHOTOS _____

COMMENTS (INDICATE IF ON BACK, TOO) _____

PLOT # _____

* HORIZON N FT/M 0 W FT/M 0 S FT/M 0 E FT/M 0

* MACRO PLOT DIMENSIONS FT/M : L/R _____ W _____

* PLOT = WHOLE FO? YES NO DESCRIBE

[illegible]

COLORADO NATURAL HERITAGE PROGRAM
POTENTIAL NATURAL AREA SURVEY FORM

PNA Name: _____ PNA #: _____

Location: _____

Quadrangle: _____ Code: _____

Map and Aerial Photo examination

Initials	Date	Photo Source	File Code	Photo No.	Photo Date	Notes
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

Survey Feature: _____

Description: _____

Is aerial survey needed? Y/N Why? _____

Experts & Other Sources

Ownership

COLORADO NATURAL HERITAGE PROGRAM
POTENTIAL NATURAL AREA SURVEY FORM, p. 2

PNA Name: _____ PNA #: _____

Aerial Survey Investigators: _____ Date: _____

Forest Age: Young _____ Mature _____ Old _____ All-age _____

Logging: None _____ Light Selective _____ Heavy Selective _____ Clearcut _____

Grazing: None _____ Light _____ Moderate _____ Heavy _____

Hydrology: Natural _____ Ditched _____ Flooded _____

Additional Notes: _____

Field Check Priority: High _____ Moderate _____ Low _____ No Longer Natural _____

Preliminary Survey Investigators: _____ Date: _____

Description/evaluation: _____

Comments: _____

Significant Elements:

Most Significant Element Occurrence

Communities S L N _____

Animals S L N _____

Plants S L N _____

Additional Notes: _____

